

106TH CONGRESS }
2d Session

JOINT COMMITTEE PRINT

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**ACHIEVING GROWTH
AND PROSPERITY
THROUGH FREEDOM:**

**A COMPILATION OF 1999-2000
JOINT ECONOMIC COMMITTEE
REPORTS**

SUBMITTED TO THE

**JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES**



DECEMBER 2000

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U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 2000

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[Created pursuant to Sec. 5(a) of Public Law 304, 79th Congress]

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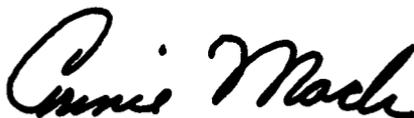
LETTER OF TRANSMITTAL

December 15, 2000

TO THE MEMBERS OF THE JOINT ECONOMIC COMMITTEE:

I hereby transmit *Achieving Growth and Prosperity Through Freedom: A Compilation of 1999-2000 Joint Economic Committee Reports*. The compilation contains eleven Joint Economic Committee staff reports. The views expressed in the reports are those of the authors, and do not necessarily represent the views of the individual Members of the Joint Economic Committee.

Sincerely,

A handwritten signature in black ink that reads "Connie Mack". The signature is written in a cursive, flowing style.

CONNIE MACK
Chairman

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Foreword to the Compilation by Senator Connie Mack

When I first ran for Congress in 1982, the U.S. economy had been in recession since the previous year. That recession was the price we paid for several years of poor monetary and fiscal policies, which resulted in double-digit inflation and federal income tax rates as high as 70 percent. President Reagan and his administration had just begun charting a new direction in economic policy, which emphasized price stability, lower tax rates, and deregulation. However, the benefits of the new policies were not yet visible, and many people thought Reagan's approach would fail. I was convinced that we needed to stay the course, and I ran on a promise to do so.

November 1982 was in fact the end of the recession. Today, as I prepare to retire from Congress, the U.S. economy continues to enjoy what has been called the Great Expansion—18 years of economic growth interrupted only by a brief, shallow recession in 1990 and 1991. This is the longest period of nearly uninterrupted growth in our history, and few episodes anywhere else in the world can match it.

Economic growth improves the human condition. It is central to fulfilling the desire we all have to see improvement in our own lives and to hand down a better world to our children. As chairman of the Joint Economic Committee, I have been particularly interested in studying how the United States can continue to enjoy sustained long-term growth. This selection contains studies made during the 106th Congress related to promoting growth.

The first two studies advance a framework for thinking about economic growth. Three key determinants of economic growth are the economic environment, technological advancements, and investment in capital (both in the form of physical capital such as machines and the "human capital" of education and skills). Governments can foster growth by ensuring that the economic environment includes secure property rights and political stability, monetary policy focused on price stability, open and competitive markets, openness to international trade and investment, and a government limited in size and financed by low taxes. During the Great Expansion, the U.S. government has generally followed policies that have provided a good economic environment (though it could do more), and it has avoided many important mistakes that made growth erratic in the 1970s.

The next two studies consider forces that have produced the "new economy" led by high technology. In the new economy, the most valuable resource is not land, mineral resources, or machines; it is entrepreneurship. The United States has become the world leader of the new economy by offering favorable conditions for entrepreneurs to put

new ideas into practice, and by refusing to use techniques of centralized economic planning that have hindered the spirit of enterprise in many other countries. During the Great Expansion, entrepreneurship has blossomed, with more Americans than ever starting new businesses. The dynamism of the new economy reflects the creativity, hard work, and willingness to take risks of millions of American entrepreneurs.

The following two studies analyze the benefits of openness to international trade. The trade sector has been a fast-growing part of the U.S. economy. Both Americans and our trading partners benefit from the goods and the ideas exchanged in international trade. International experience strongly supports the claim that openness to trade promotes economic growth. Despite the benefits of international trade, though, strong political pressure often exists to restrict trade for the benefit of special-interest groups at the expense of consumers or taxpayers as a whole. The studies investigate why pressures for protectionism arise and why trade deficits do not justify protectionist measures.

The next four studies discuss dollarization—the use of the U.S. dollar as official currency in foreign countries. Poor monetary policy has been a serious obstacle to economic growth in many countries. By importing the relatively strong performance of the U.S. dollar, dollarization overcomes that obstacle. Ecuador became dollarized in 2000, El Salvador has passed a law to do so in 2001, and other countries, particularly in Latin America, are also interested in dollarization. The studies describe how dollarization works, how it can benefit both a country that chooses to dollarize as well as the United States, and what the United States can do to promote dollarization.

The final study considers Social Security, the single largest government program. As Americans enjoy longer lives, under the current “pay as you go” system, retirees place a greater burden of financing Social Security on workers. The study explains how moving toward a “fully funded” system, in which each generation funds its own retirement, can make Social Security a better deal for workers while continuing to provide a secure source of income for retirees. Many other countries have already moved or are moving in the same direction, and the United States can learn from their experience.

This selection only includes a portion of the studies produced by the Joint Economic Committee has produced. Other studies, covering a wide range of topics, are available on the committee Web site. I hope you will find them all informative and useful.

To be an American is, almost by definition, to be an optimist. I am optimistic that we can sustain strong economic growth and improve economic policy by careful consideration of economic ideas and events, such as the studies here provide.

**The 1999 Joint
Economic Report
(chapters 1-5)**

October 1999

**Joint Economic Committee
Office of the Chairman,
Senator Connie Mack**

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THE 1999 JOINT ECONOMIC REPORT

Mr. MACK, from the Joint Economic Committee,
submitted the following

REPORT**OVERVIEW OF THE ECONOMY**

The performance of the U.S. economy continues to be impressive. During the last 16½ years, the United States has experienced only eight months of recession. While growth is lower than it was during the 25 years following World War II, there is evidence that this too may be changing. In summary, the U.S. economy is healthy and strong.

The current economic expansion, which began in the second quarter of 1991, has lasted for 102 months. It is expected to surpass the record 106-month expansion of 1961-69. The current expansion appears to be highly resilient. Compared with previous expansions, it has featured low and stable inflation, unusually strong growth in investment, and an unexpected recent upturn in the growth of productivity.

Most observers agree that this extended run of good performance has occurred in large part because the United States has made no major macroeconomic policy errors in recent years. In particular, the Federal Reserve has gradually but steadfastly reduced inflation. If current projections hold, inflation will be below 2 percent this year for the third consecutive year. The United States has not achieved this degree of price stability since the early 1960s. Lower inflation has translated into lower interest rates. Although the Federal Reserve recently acted to nudge short-term rates higher, long-term rates are generally lower than they have been during the last three decades.

Lower inflation and interest rates have fostered economic growth. Real gross domestic product (GDP) has grown an average of 3.85 percent over the last six quarters. For 1999 as a whole, the

Congressional Budget Office forecasts real GDP growth in excess of 4 percent — the best rate since 1984.

Economic growth has produced impressive gains in both employment and productivity. During the first eight months of this year, the rate of unemployment fluctuated between 4.2 percent and 4.4 percent, rates not seen since the 1960s. Unlike previous economic expansions, productivity has not suffered as the expansion has aged. In fact, the growth of productivity has accelerated in recent years. Productivity in manufacturing grew 5.3 percent in the past year. Overall productivity grew a healthy 3 percent from the second quarter of 1998 to the second quarter of 1999. Because productivity in the service sector is especially difficult to measure, overall productivity growth may actually be higher than the official figure.

Forward momentum in productivity, employment, and economic activity has led to a sizable increase in federal tax revenue. Consequently, the federal government ran its first budget surplus in a generation last year. The Congressional Budget Office projects an even larger surplus for 1999. The federal government has not run back-to-back budget surpluses since 1956-57. If current projections hold, the budget will remain in surplus throughout the next decade.

In the last few years, the United States has been one of the few consistent bright spots in the world economy. It is important for the rest of the world, as well as for ourselves, that the U.S. economy continues to grow. It is also important that we better understand the sources of growth and prosperity so we can follow policies that encourage them. The majority staff report focuses on the topic of maximum sustainable economic growth and analyzes the factors that contribute to it. We believe that the staff report will enhance understanding of why some economies succeed while others fail. Through its hearings and staff reports, the Joint Economic Committee endeavors to shed light on the important economic issues facing the United States. Additional information is available on our Web sites (for the office of the chairman, <<http://jec.senate.gov>>; for the office of the vice chairman, <<http://www.house.gov/jec>>).

SENATOR CONNIE MACK
Chairman

REPRESENTATIVE JIM SAXTON
Vice Chairman

INTRODUCTION

The U.S. economy is healthy. Both inflation and unemployment are low. The economic stability the United States has experienced since 1982 is unprecedented. The current expansion is already the second longest on record, and is on course to become the longest. Even though most of Asia and Latin America are in recession (or beginning recovery), the U.S. economy continues to grow.

This report focuses on the long-term growth of the U.S. economy, and examines how it compares both to rates of growth in other countries today and rates of growth that the United States itself has experienced in previous periods. It addresses such questions as: What accounts for the movement of the U.S. economy from stagflation in the late 1970s to low inflation and almost continuous growth since 1982? How does the growth of the recent period compare with that of the 1950s and 1960s? What lessons can be learned from the experience of other economies? What are the economic prospects for the future and what steps might be taken to improve our future rate of growth?

The emphasis of this report is on achieving the maximum sustainable rate of economic growth. Both "sustainable" and "growth" are key words. Reports of this type often focus on current conditions rather than the underlying factors that determine long-term economic performance. Yet over the long term, seemingly small differences in annual growth rates exert a huge impact on living standards.

Growth is complex, resulting from the interaction of institutions, incentives, and individual preferences. While there is no precise recipe for economic growth, we do have a good idea of the main ingredients. They include monetary stability, competitive markets, secure property rights, and an appropriate size of government. Government policies strongly influence economic growth. Unsound policies can lead to stagnation or even a shrinking economy, while sound policies can increase the rate of growth. The United States has recently had faster growth than other large industrialized countries, but growth in the 1990s has been slower than in many previous decades. Current international experience and historical experience suggest that there is nothing inevitable about slower growth. This leads us to conclude that the U.S. economy could achieve a higher rate of sustainable growth.

It is important to distinguish between economic stability and economic growth. Stability is necessary but not sufficient for fast growth. In the next few years, policy makers will confront issues that will influence the growth rate of the U.S. economy and the living standards of Americans for decades to come. This report explains the issues and presents a blueprint for achieving maximum future prosperity.

1. ECONOMIC STABILITY AND MONETARY POLICY

If nothing else, the experience of the last decade has reinforced earlier evidence that a necessary condition for maximum sustainable economic growth is price stability.

Alan Greenspan
 Testimony to the House Committee on
 Banking and Financial Services
 July 22, 1999

Three decades ago, policy makers and economists alike generally thought that monetary policy could be used to smooth ups and downs in the business cycle and keep unemployment low. However, efforts to use monetary policy in this manner led to inflation and economic instability during the 1970s. People do not act mechanically, as the models of three decades ago assumed; they change their expectations and behavior in response to policies. Once this became better understood, the limitations of monetary policy became more evident. During the last fifteen years, monetary policy has focused on a narrower objective—price stability. The closer monetary policy has come to achieving price stability, the more stable the economy has been and the lower the rate of unemployment has fallen.

When policy makers sought to achieve more than monetary policy could deliver, they created instability. In contrast, when they focused on the objective that monetary policy could deliver, they enhanced the overall performance of the economy.

I. The Importance of Price Stability

The high standard of living that Americans enjoy is the result of gains from specialization, division of labor, and mass production processes. To realize those gains, trade and a smoothly functioning price system are necessary. High and variable rates of inflation generate uncertainty and reduce the efficiency of a market economy. Price stability contributes to economic growth and the efficient use of resources in several ways.

1. Price stability reduces the uncertainty accompanying decisions, such as saving and investing, that involve transactions across time. When the general level of prices is constantly changing from year to year, no one knows what to expect. Unanticipated changes of even 3 percent or 4 percent in the rate of inflation can turn an otherwise profitable venture into an unprofitable one. The uncertainty generated by inflation reduces the attractiveness of both saving and

investing. As a result, both will be lower than they would be under price stability.

2. When the price level is stable, relative prices direct resources more consistently toward the most productive uses. Prices communicate important information about the relative scarcity of goods and resources. Inflation distorts this information. Some prices can be easily and regularly changed, but that is not true for other prices, particularly those set by long-term contracts. There will be delays before the prices for rental agreements, items sold in catalogs, mortgage interest rates, and collective bargaining contracts can be modified. Because some prices respond more quickly than others, unanticipated changes in inflation affect *relative prices* as well as the *general price level*. As a result, prices become a less reliable indicator of relative scarcity. Producers and resource suppliers then make mistakes they would not make under stable prices, and the allocation of resources is less efficient.

3. People respond to high and variable inflation by spending less time producing and more time protecting themselves from inflation. Because failure to anticipate the rate of inflation can have a substantial effect on one's wealth, individuals divert scarce resources from production toward speculation. Funds flow into speculative investments such as gold, silver, and art objects rather than into productive investments, such as buildings, machines, and technological research, that expand the economy's potential output and generate economic growth.

II. Inflation and the Tax Code

Inflation can also hurt economic growth through interaction with the tax code. Even modest rates of inflation can alter the effective tax rate on savings and investment, making it substantially higher than the statutory tax rate. That is true even if the overall tax structure is indexed. There are two major areas where such inequities are particularly important.

1. Inflation and capital gains taxes. Inflation increases the effective tax on capital gains. If someone buys an asset for \$1,000 and sells it for \$2,000, the gain is \$1,000. If the statutory tax rate on capital gains is 20 percent, the tax liability is \$200. If the general price level was stable during the years the asset was held, the 20 percent rate is the effective tax rate. So, when prices are stable, the effective and statutory tax rates are the same.

In contrast, consider what happens when inflation pushes the price level up by 50 percent during the holding period of the asset, so that \$1,000 at the start of the period is equal to \$1,500 at the end. If the

asset is sold for \$2,000, the real (inflation-adjusted) capital gain, measured in current dollars, is only \$500. Nonetheless, under current law, the capital gains tax is still \$200 because the 20 percent rate does not adjust for the effect of inflation. The statutory capital gains rate is only 20 percent, but the real, effective tax rate is 40 percent—\$200 divided by the real capital gain of \$500. When assets are held for lengthy periods, even low inflation can drastically alter the effective tax rate on capital gains, forcing people to pay taxes even when they suffer real capital losses. This increases the cost of capital, thereby deterring investment and retarding economic growth.

2. Inflation and taxes on interest. Inflation also increases the effective tax on interest and thereby reduces the incentive to save. Suppose prices are stable and an individual in the 28 percent tax bracket earns 5 percent interest on \$100 of savings. After taxes, the individual ends up with \$3.60. Because prices are stable, the after-tax, inflation-adjusted interest rate is 3.6 percent.

Now consider what happens when persistent inflation of 5 percent pushes nominal interest rates up to 10 percent. After taxes the individual ends up with \$7.20 (\$10 less the 28 percent tax liability). But \$5 of this is due to inflation, leaving the individual with an after-tax, inflation-adjusted interest return of only \$2.20 (2.2 percent). The effective tax rate is 56 percent, twice the statutory rate.

These examples highlight one benefit of price stability: it keeps effective tax rates on capital gains and interest in line with statutory rates. Inflation pushes effective tax rates on capital gains and interest to exceedingly high levels.¹

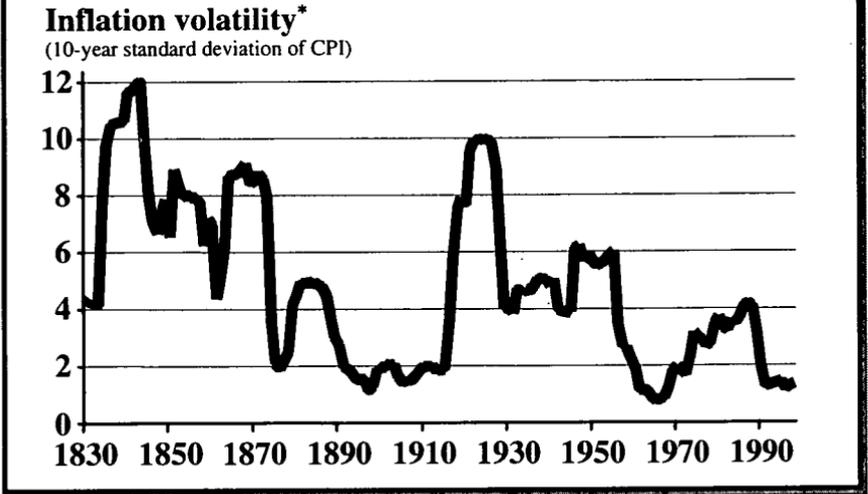
III. Two Key Propositions of Monetary Policy

It is crucial to understand two things about monetary policy.

1. Persistent increases in the general level of prices are always the result of excessive growth in the money supply. Inflation is a monetary phenomenon. Inflation is the result of too much money chasing too few goods. When the money supply expands more rapidly than goods and services, the additional money is used to bid up the general level of prices. Viewed from another perspective, when the supply of money exceeds the quantity that people are willing to hold at the existing price level, they spend more, putting upward pressure on the price level. If the increase in the money supply was unanticipated, the additional spending may stimulate output and employment in the

¹Inflation also reduces the value of depreciation allowances. This results in an overstatement of the net income derived from depreciable assets, which increases the effective tax rate imposed on them. It also causes the effective tax rate on the return from depreciable assets to exceed the statutory rate.

Figure 1.1: Inflation Volatility in the United States, 1830-1998



Sources: Global Financial Data; Haver Analytics.

Note: *Based on December-to-December changes in Consumer Price Index.

short run. However, sustained expansion of the money supply at an overly rapid rate soon pushes the price level upward, causing inflation.

The experience of the United States and other countries is consistent with this view. Low rates of growth in the money supply are associated with low inflation, while high rates are associated with high inflation. The long-term link between growth in the money supply and inflation is one of the most consistent empirical relations in economics.

2. Monetary policy can achieve price stability. When it does, it has done its part to promote maximum growth and employment. When the general level of prices shows signs of rising, monetary restraint can bring it back under control. The Federal Reserve can drain reserves from the banking system and increase the federal funds rate (the rate banks pay to borrow from each other the deposits they hold as reserves at the Federal Reserve). By shifting to a more restrictive monetary policy, the Federal Reserve reduces total spending, which places downward pressure on the price level. Correspondingly, the Federal Reserve can combat deflation—a decline in the general level of prices—by shifting to a more expansionary monetary policy.

The level of prices reflects monetary policy. Monetary policy should focus on attaining price stability. Price stability reduces uncertainty, improves the efficiency of markets, and promotes full employment.

How should price stability be defined? Federal Reserve Chairman Alan Greenspan has testified on several occasions that price stability is the point at which changes in the general price level are no longer a significant consideration when people make economic decisions. Implicit in this definition is the element of credibility. If prices are stable today but people believe they will rise in the future, long-term interest rates will stay higher than necessary, limiting the investment needed to raise living standards. When monetary policy achieves stable prices and convinces the public that the price stability will continue in the future, it has done its part to promote economic growth and prosperity.

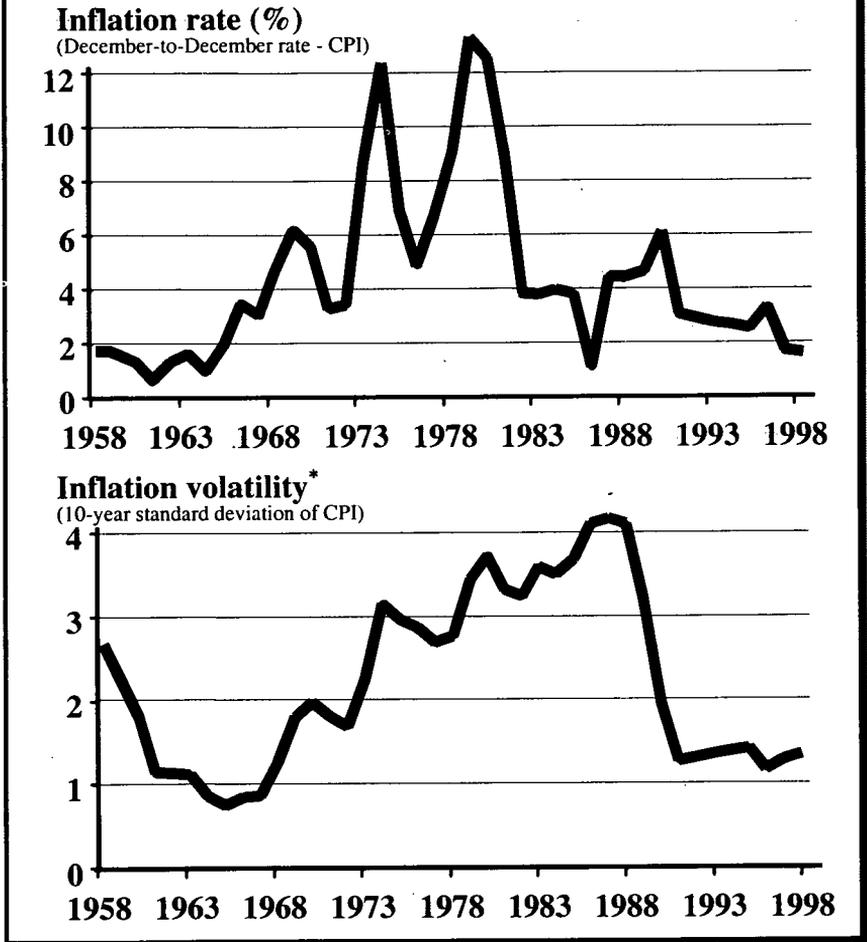
IV. The Remarkable Record of the Last Two Decades

Since the double-digit inflation of the 1970s, policy makers and economists alike have become increasingly aware of the importance of price stability. Under the chairmanships of Paul Volcker and Alan Greenspan, the focus of the Federal Reserve has been to reduce inflation and move toward price stability.

This policy has been highly effective. It is informative to place the current policy in historical perspective. Figure 1.1 shows the ten-year moving standard deviation of inflation from 1830 to 1998. A low standard deviation indicates little volatility in year-to-year changes in inflation. When inflation is low and steady over a lengthy period, people come to anticipate it and adjust their choices accordingly. Long-term interest rates tend to be low and do not change much in response to unanticipated blips in the price level. Because the figure measures volatility over ten-year moving periods, it indicates credibility—the extent to which people can count on the continuation of the policy. The lower the standard deviation, the closer the economy comes to long-term price stability. As the figure shows, inflation was steadiest in the two decades prior to World War I, the 1960s, and the last ten years. It was more volatile from 1830 to 1870, 1915 to 1950, and from the 1970s to the early 1980s.

Figure 1.2 takes a closer look at inflation and its volatility during the last four decades. As the top frame shows, inflation rose from 1965 to 1980, and was particularly high and variable in the 1970s. It fell abruptly during the recession of 1982 and has been on a gradual downward trend since. The bottom frame illustrates that after falling during the first half of the 1960s, the ten-year volatility of inflation rose persistently throughout the next two decades. It fell sharply in the late 1980s and early 1990s, following a decade of relative price stability, and since 1991 has remained below 1.5 percent. If inflation

Figure 1.2: Inflation and Inflation Volatility in the United States, 1958-1998



Sources: Global Financial Data; Haver Analytics.

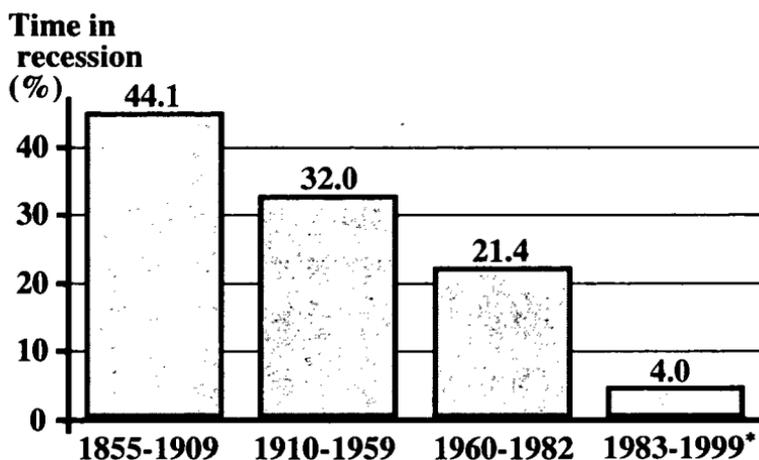
Note: *Based on December-to-December changes in Consumer Price Index.

can be maintained in the 1 percent to 2 percent range during the next few years, the ten-year volatility of inflation may reach an all-time low.

Many economists argue that monetary shocks have been a major source of economic instability.² If they are correct, periods of price

²Milton Friedman summarized this position when he stated, "Every major contraction in this country has been either produced by monetary disorder or greatly exacerbated by monetary disorder. Every major inflation has been produced by monetary expansion." Milton Friedman, "The Role of Monetary Policy," *American Economic Review*, v. 58 (March 1968), p. 12.

Figure 1.3: Increased Stability of U.S. Economy



Source: Carl Walsh, Federal Reserve Bank of San Francisco *Economic Letter* 99-16, May 14, 1999.

Note: *Final period ends with June 1999.

stability should also be associated with stable growth and a high level of employment. This has indeed been the case. Not only has inflation been low and relatively stable during the last 16 years, but the overall stability of the economy has been unprecedented. As Figure 1.3 shows, the amount of time the U.S. economy has spent in recession has declined from 44 percent during 1855-1909 to only 4 percent since 1982. The current era has had the least amount of recession of any comparable period in American history.

Monetary policy deserves most of the credit for the remarkable stability of the U.S. economy since 1982. From 1983 to 1998, the year-to-year change in inflation never exceeded 1.2 percentage points. The Federal Reserve followed policies consistent with low and stable inflation and its policies led to economic stability. This experience provides strong evidence that monetary policy consistent with price stability is a key, perhaps the key, to stable growth and an environment that permits unemployment to fall.

V. The Limitations of Monetary Policy

While monetary policy can achieve price stability, several important economic objectives are beyond its reach. Efforts to use

monetary policy to achieve these objectives will not only fail; they will lead to economic instability.

1. Stop-go monetary policy cannot smooth the ups and downs of the business cycle. Rather, it increases economic instability. In the 1960s and 1970s it was widely believed that monetary policy could be used to smooth the ups and downs of the business cycle. The proponents of this view argued that monetary policy could stimulate the economy during recessions and restrain it during booms, promoting higher average growth, more stable output, and lower unemployment.

As the experience of the 1970s shows, monetary policy makers lack sufficient information to adjust policy to smooth the business cycle. There is a lag between when a policy change is instituted and when it begins to affect output and employment. Studies indicate that the lag is lengthy and unpredictable, generally ranging from 6 to 18 months. Furthermore, changes in economic conditions are often the result of unforeseen economic shocks such as droughts, wars, political revolutions, and financial crises. Our ability to forecast such shocks is limited. Proper timing would require monetary policy to change an unknown and variable number of months before a recession or boom that itself is unlikely to be foreseen. That is beyond the capability of economics.

Incorrectly timed attempts to stabilize the economy through monetary policy have destabilizing effects. Accordingly, most economists now believe that monetary policy should follow a stable and transparent course focused on price stability. If it achieves price stability, output and employment will also be relatively stable.

2. Expansionary monetary policy cannot enhance the long-term growth of output and employment. Attempts to use monetary policy in expansionary fashion lead to inflation. Once people come to expect inflation, it no longer spurs output and employment. While economists continue to debate how quickly people alter their expectations in response to a change in the rate of inflation, the controversy is about whether there may be some temporary impact. Almost all economists now agree that in the long run, trying to stimulate employment through expansionary monetary policy causes inflation and destabilizes the economy.

3. Expansionary monetary policy cannot reduce the unemployment rate. In the 1960s and 1970s, many economists thought there was a tradeoff between inflation and unemployment. They believed that the unemployment rate could be reduced if we were willing to tolerate a little more inflation. This view was incorporated into policy. The Full Employment and Balanced Growth Act of 1978

implicitly assigned the Federal Reserve System responsibility for reducing unemployment to no more than 4 percent.³

An unanticipated shift to a more expansionary policy may temporarily reduce the unemployment rate. However, any reduction will be short-lived. As soon as decision makers anticipate the higher rate of inflation and adjust their decisions accordingly, unemployment will return to its normal level—the sustainable rate consistent with the composition of the labor force and structure of the labor market. Even high rates of inflation will fail to reduce unemployment once people anticipate them. There is no permanent tradeoff between inflation and unemployment.

4. Expansionary monetary policy cannot permanently reduce interest rates. Expansionary policy leads to high rather than low interest rates. Political leaders often suggest that the Federal Reserve follow a more expansionary monetary policy to reduce interest rates. The Federal Reserve can use its control over bank reserves to influence short-term interest rates. However, the Federal Reserve's control over long-term interest rates is far more limited. Furthermore, while monetary expansion may reduce short-term interest rates, if it persists it will increase long-term rates. Persistent monetary expansion leads to inflation. Once people begin to anticipate higher inflation, long-term interest rates rise.

High interest rates do not necessarily mean that monetary policy is too restrictive. In the United States, interest rates were high during the 1970s, a period of expansionary monetary policy and inflation. On the other hand, low interest rates do not necessarily signal that monetary policy is expansionary. Interest rates in the United States were relatively low during the 1960s and 1990s, periods of more restrictive

³Economists refer to the relationship between inflation and unemployment as the Phillips Curve. Paul Samuelson and Robert Solow, who later won Nobel Prizes in economics, claimed, "In order to achieve the nonperfectionist's goal of high enough output to give us no more than 3 percent unemployment, the price index might have to rise by as much as 4 to 5 percent per year. That much price rise [inflation] would seem to be the necessary cost of high employment and production in the years immediately ahead." Paul A. Samuelson and Robert Solow, "Analytical Aspects of Anti-Inflation Policy," *American Economic Review*, v. 50 (May 1960), p. 192. The alleged inflation-unemployment tradeoff was even incorporated into the *Economic Report of the President* for 1969 (p. 95).

Today, the dominant view among economists is that economic stability and the highest sustainable rate of economic growth are goals best achieved by maintaining long-term price stability. Senator Connie Mack (R-Florida) has introduced the Economic Growth and Price Stability Act of 1999, which would make long-term price stability the primary goal of Federal Reserve policy.

monetary policy. During the Great Depression, interest rates fell to less than 1 percent. Rather than reflecting an expansionary monetary policy, low interest rates reflected a highly restrictive monetary policy that was causing deflation and the expectation of a falling price level.

Internationally, the picture is the same. The highest interest rates in the world have occurred in countries experiencing hyperinflation—Argentina and Brazil in the 1980s and Russia in the 1990s, for example. In the late 1990s, interest rates in Japan fell below 1 percent. As with the United States during the Great Depression, low interest rates in Japan today reflect a highly restrictive monetary policy that has led to a falling price level and the expectation of deflation.

VI. Conclusion

The experience of the last two decades highlights the importance of monetary policy. Monetary policy helps the economy most when it focuses on providing price stability. Price stability enables people to make more accurate economic decisions, enabling them to employ labor and other resources to the fullest extent under existing conditions.

2. WHY ECONOMIC GROWTH MATTERS AND HOW TO ACHIEVE IT

1. The Importance of Economic Growth

Good monetary policy is necessary but not sufficient for economic growth. A country can have economic stability yet lack dynamism because excessive taxes and regulation hinder growth.

Economic growth is the key to higher living standards. Output and income are closely linked; in fact, output must grow for income to grow. Expansion in output per person is vitally important because it makes higher living standards possible.

Over long periods, seemingly small differences in growth rates have big effects on income. The “rule of 70”⁴ helps to illustrate this point. Dividing 70 by a country’s average growth rate approximates the number of years required for income to double. At an average annual growth rate of 2 percent, income doubles in 35 years (70 divided by 2). In contrast, at a 4 percent annual growth rate, income doubles in only 17.5 years (70 divided by 4). If two countries have the same initial income level, after 35 years the income of the country growing at 4 percent will be twice that of the country growing at 2 percent.

Sustained reductions in annual rates of growth can cause major problems, while sustained increases can help resolve them. The budget deficits of the U.S. during the last ten years illustrate this point. From 1990 to 1992, real GDP grew only 0.9 percent a year. Largely as a result, the federal budget deficit ballooned from \$152 billion (2.8 percent of GDP) in 1989 to \$290 billion (4.7 percent of GDP) in 1992. In contrast, from 1994 to 1998, real GDP grew 3.4 percent a year and the large budget deficit of 1992 became a \$69 billion surplus by 1998.

The most important problem currently confronting the U.S. economy is planning for the increased burden of retirement and health care benefits as the “baby boom” generation starts to retire beginning around 2010. The weight of the burden will depend on the growth of the U.S. economy in the years immediately ahead. If the economy grows at a 3.5 percent annual rate during the next two decades, real GDP will be 100 percent above the current level 20 years from now. That will substantially increase the economy’s ability to support the baby boomers in retirement. On the other hand, if the economy grows at only 2.4 percent a year, as it did from 1986 to 1995, real GDP 20 years from now will be only 60 percent above the current level. Clearly, the burden of Social Security and Medicare will be much

⁴ Also known as the rule of 72. For lower numbers, using 70 provides more accurate results; for higher numbers, using 72 provides more accurate results.

Figure 2.1: Key Determinants of Economic Growth

1. Investment in physical and human capital
2. Technological improvements
3. Efficiency of institutions and policies
 - (A) Secure property rights and political stability
 - (B) Competitive markets
 - (C) Monetary stability
 - (D) Freedom to trade with foreigners
 - (E) Size of government and level of taxes

greater if growth is slower. As these and other programs are modified, it is vitally important for policy makers to focus on how the changes will affect future economic growth.

II. Determinants of Economic Growth

Economic growth is complex. Several factors play important roles, and they are often related. Weakness in one or two key areas can undermine growth. Although economics does not provide a precise recipe for economic growth, it does highlight several ingredients that are important.⁵

Figure 2.1 lists the major factors that influence economic growth. Building on the work of Robert Solow, many economists stressed the importance of inputs and technology as sources of economic growth during the three decades following World War II.⁶ The Solow model indicates that growth results from expansion in the resource base and improvements in technology. Several researchers sought to measure the growth of the stock of physical and human capital and use these figures to estimate their contribution to the growth of output. The unexplained residual was thought to be the result of advancements in technology.

Inputs are vitally important for economic growth, but they are not created and used in a vacuum. The economic environment influences

⁵There is nothing automatic about economic growth. Of the 152 countries for which data are available, 45 (about 30 percent) experienced reductions in real GDP per person from 1990 to 1997.

⁶Robert Solow, "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, v. 70 (February 1956), pp. 65-94.

the incentives to supply inputs and the efficiency with which they are used. Reflecting this point, recent work on economic growth integrates the quality of the economic environment—property rights, monetary stability, taxation, government spending, and regulation—into the analysis of growth. In many ways, this “new growth theory” is a return to the approach of Adam Smith, who also stressed the importance of the economic environment.⁷ The new approach has several strands.

1. Investment in physical and human capital. Investment in physical capital (tools, structures, and machines) and human capital (education and training) can increase the productivity of workers. When workers make more goods and services valued by others, they can increase their incomes. Other things being equal, countries using a larger share of their resources to produce tools, machines, and factories tend to grow more rapidly. Spending more on education and training also tends to enhance economic growth.

Investment is not a free lunch. As more is spent to increase physical and human capital, less is available to spend on goods and services for current consumption. Furthermore, if investment is to expand output and income, it must be channeled into productive projects. High rates of investment do not always lead to more rapid growth, as the centrally planned economies of Eastern Europe and the former Soviet Union illustrate. They had high rates of investment but unimpressive rates of growth, because they invested so much in unproductive projects.

2. Technological advancements. Research and brainpower can be used to discover lower-cost methods of production and to produce valuable new products. During the last 250 years, science and technology have exerted a remarkable impact on living standards. The steam engine and later the internal combustion engine, electricity, and nuclear energy have vastly altered our sources of power. The railroad, automobile, and airplane have dramatically changed both the cost and speed of transportation.

Science and technology continue to transform our lives. During the last 30 years, life-saving drugs, heart transplants, MRI and CAT scans, and laser surgery have transformed health care. Word processing equipment, fax machines, and electronic mail have vastly improved the speed and accuracy of communications. In the home, new technologies

⁷The new approach builds on the work of Peter Bauer and Douglass North. See P. T. Bauer, *Dissent on Development: Studies and Debates in Development Economics* (Cambridge, Massachusetts: Harvard University Press, 1972) and D. C. North, *Institutions, Institutional Change, and Economic Performance* (Cambridge: Cambridge University Press, 1990). Other leading contributors to the new approach include Robert Barro, Arnold Harberger, and Gerald Scully.

ranging from microwave ovens to personal computers have improved the quality of our lives. If anything, the speed of technological development appears to be accelerating as we head into the next century.

However, technology alone does not produce economic growth. Developing countries are in a position to emulate (or import at low cost) technologies that have been successful in developed countries. If technology were the primary factor limiting the creation of wealth, most developing countries would rapidly be catching up to developed countries. However, many developing countries have fallen farther behind even though modern technology is readily available to them.

3. Economic environment. Investment and technology are important for economic growth. But they are influenced by a country's institutional structure and the policy environment. Countries with a sound economic environment tend to attract investors willing to supply resources and adopt technological improvements. It is vitally important to incorporate the institutional and policy structure of countries into the analysis of economic growth. Models of economic growth that fail to incorporate the economic environment may well be omitting the key factor underpinning sustainable growth. The key difference between a centrally planned economy and a market economy is the economic environment.

III. Institutions and Policies for Economic Growth

Economic theory suggests several key institutions and policy factors that are important for the achievement of maximum economic growth. Figure 2.1 lists them.

1. Secure property rights and political stability. A legal system committed to protecting individuals and their property is a minimal prerequisite for sustained economic growth. Private ownership protects property and property owners against those seeking to acquire wealth by violence, theft, or fraud. Without well-defined and well-enforced property rights, investors will not be willing to buy equipment and other fixed assets that fuel economic growth.

The most important thing about private ownership is the incentives it provides. Private ownership holds people accountable for their actions. Under private ownership, people get ahead by providing things that other people value and by engaging in actions that increase the value of resources. To use a good or resource, you must buy or lease it from the owner. Each economic participant faces the cost of using scarce resources. To succeed in business, you must bid resources away from other potential users and provide customers with goods and services more valuable than the cost of production. There is therefore a

strong incentive to use resources productively—to discover and undertake actions that generate economic growth.⁸

A volatile political climate undermines the security of property rights. Some governments have confiscated physical and financial assets, imposed punitive taxes, and used regulations to punish their political enemies. Countries with this kind of history find it difficult to guarantee the security of property rights and gain the confidence of potential investors.

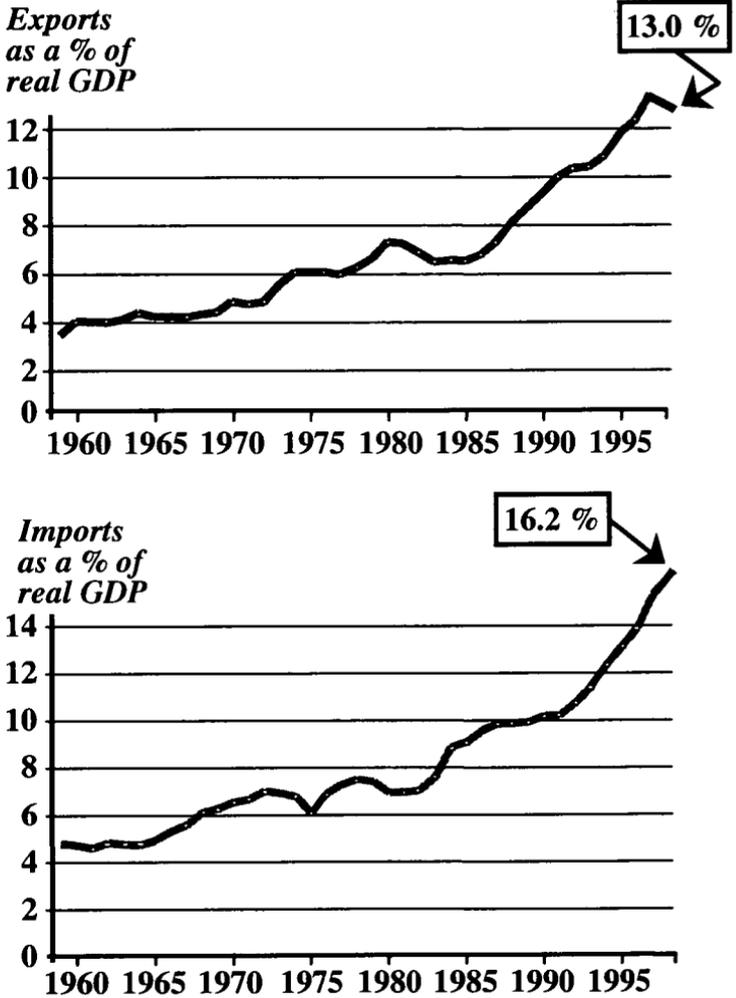
2. Competitive markets. Competition is the disciplining force of a market economy. As Adam Smith stressed long ago, when competition is present, even self-interested individuals engage in actions that promote the general welfare. In a competitive environment, producers must woo the dollar “votes” of consumers away from other suppliers. To do so, they must produce goods efficiently and provide consumers with worthwhile products. Sellers who cannot provide quality goods at competitive prices are driven from the market. This process leads to improvement in both products and production methods, while directing resources toward projects where they are able to produce more value. It is a powerful stimulus for economic growth.

Such policies as unhampered entry into business and freedom of exchange with foreigners enhance competition and thereby help to promote economic progress. In contrast, business subsidies, price controls, entry restraints, and trade restrictions stifle competition and retard economic growth.

3. Stable money and prices. A stable monetary environment provides the foundation for the efficient operation of a market economy. In contrast, monetary and price instability generate uncertainty and undermine the security of contracts. When prices increase 10 percent one year, 30 percent the next year, 15 percent the year after that, and so on, individuals and businesses are unable to develop sensible long-term plans. In response, people save less, and businesses move their activities to countries with a more stable monetary environment. Foreigners invest elsewhere, and citizens often go to great lengths to get their savings out of the country. As a result, potential gains from capital formation and business activities are lost.

4. Freedom to trade with foreigners. International trade makes it possible for people to specialize in making the things they are best at—those they produce most efficiently. Trade also enables people to use

⁸For evidence that a legal system that protects property rights, enforces contracts, and relies on the rule of law to settle disputes promotes economic growth, see Stephen Knack and Philip Keefer, “Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures,” *Economics and Politics*, v. 7 (1995), pp. 207-27. See also Tom Bethell, *The Noblest Triumph* (New York: St. Martin’s Press, 1998).

Figure 2.2: Growth in U.S. Trade Sector

Sources: *Economic Report of the President*, 1999; Haver Analytics.

the revenue from selling the things they produce for goods that are produced most efficiently abroad. Specialization and trade are mutually advantageous. Each trading partner produces more and earns more income than would otherwise be possible. Economists call this the law of comparative advantage.⁹

⁹The impact of international trade on the level and growth of income is an area where economic fallacies abound. See Joint Economic Committee, Office of

Both reductions in trade barriers and lower transport costs lead to more international trade. As a country shifts more and more of its resources toward economic activities that it performs well, it achieves higher levels of output and income. Increased openness and lower transport costs have helped expand international trade during the last several decades. Approximately 21 percent of the world's total volume of output is now sold in a different country from where it was originally produced—double the proportion of 1960.

As Figure 2.2 shows, the exports and imports of the United States have grown rapidly in recent decades. Exports increased from 7 percent of GDP in 1980 to 13 percent in 1998. Imports rose even faster, from 7 percent of GDP in 1980 to 16 percent in 1998. The expansion in the trade sector has contributed to the health of the U.S. economy.

5. Appropriate size of government. Governments can enhance growth by providing an infrastructure for the smooth operation of markets. Important functions in this area include a legal system capable of protecting people and property, and a monetary system that provides price stability. In addition, governments may enhance growth by providing a limited set of goods—which economists call public goods—that are troublesome to supply through markets because of the difficulties of making all who enjoy the goods pay for them. Examples include national defense, flood control, and air and water quality. Government spending that expands educational opportunity and the development of human capital may also stimulate economic growth.

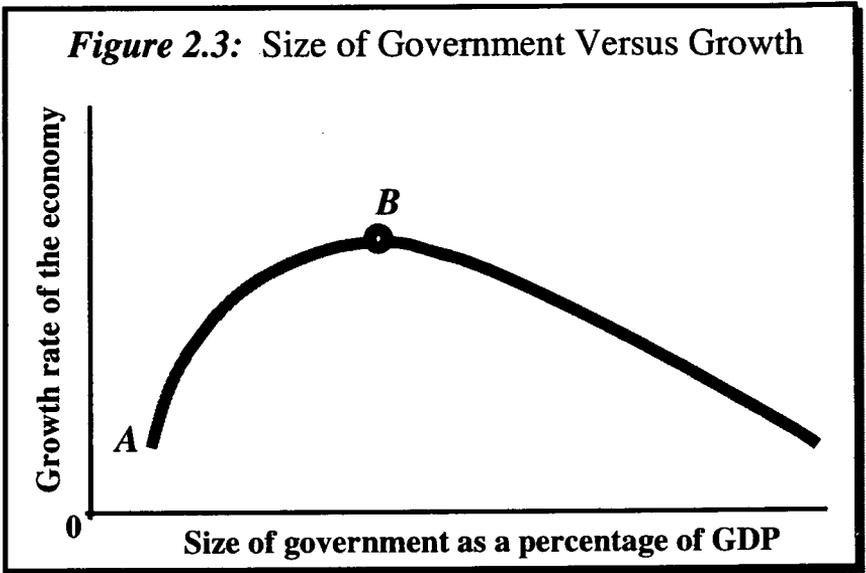
However, a government that grows too large retards economic growth in a number of ways. First, as government grows relative to the market sector, the returns to government activity diminish. The larger the government, the greater is its involvement in activities it does poorly.

Second, more government means higher taxes. As taxes take more earnings from citizens, the incentive to invest, develop resources, and engage in productive activities declines.

Third, compared to the market sector, government is less innovative and less responsive to change. Growth is a discovery process. In the market sector, entrepreneurs have strong incentives to discover new and improved technologies, better methods of doing things, and opportunities that were previously overlooked. Also, they are in a position to act quickly, as new opportunities arise.¹⁰ In

the Chairman, "12 Myths of International Trade," July 1999, available online at <<http://www.senate.gov/~jec/trade1.html>>.

¹⁰The writings of Israel Kirzner and Joseph Schumpeter highlight this point. See Israel M. Kirzner, *Competition and Entrepreneurship* (Chicago: University of Chicago Press, 1973); and Joseph A. Schumpeter, *The Theory of*



government, the nature of the political process lengthens the time required to modify bad choices (such as ending ineffective programs) and adjust to changing circumstances. As the size of government expands, the sphere of innovative behavior shrinks.

Finally, as government grows, it becomes more heavily involved in redistributing income and in regulatory activism. That induces people to spend more time seeking favors from the government and less time producing goods and services for consumers.¹¹

Government provision of certain core goods and services can enhance economic growth. However, as government grows larger it eventually retards growth as it undertakes more and more activities for which it is ill suited. Figure 2.3 illustrates the expected relationship between the size of government and economic growth, *assuming that government undertakes the most beneficial activities first*. As the size of government (horizontal axis) expands from zero, initially the growth rate of the economy—measured on the vertical axis—increases. The part of the curve from point A to point B shows the initial positive impact of more government on economic growth. However, as government becomes increasingly large, it spends increasingly more on

Economic Development, trans. Redvers Opie (Cambridge, Massachusetts: Harvard University Press, 1934—original German-language publication 1912).

¹¹Gordon Tullock, "The Welfare Costs of Tariffs, Monopolies, and Theft," *Western Economic Journal*, v. 5 (1967), pp. 224-32; and Anne O. Krueger, "The Political Economy of the Rent-Seeking Society," *American Economic Review*, v. 64 (1974), pp. 291-303.

activities that yield few or even negative benefits. The rate of economic growth falls, as shown by the part of the curve to the right of point B.¹² A government that engages in appropriate activities and is not too large maximizes economic growth. Expanding government beyond the optimal size retards growth.

¹²For a formal model with the characteristics outlined here, see Robert J. Barro, "Government Spending in a Simple Model of Endogenous Growth," *Journal of Political Economy*, v. 98 (1990), pp. S103-S125.

3. WHY HAS THE UNITED STATES GROWN FASTER THAN OTHER LARGE ECONOMIES?

Compared to other large industrial nations, the recent performance of the United States is quite impressive. As Figure 3.1 shows, during the 1990s the United States has been the fastest growing of the seven largest industrial economies. The U.S. growth rate has been twice that of Italy and significantly higher than those of Japan, the United Kingdom, France, and Canada. Only Germany has achieved similar growth during the decade, and during the past six years even its growth has been sluggish—just 1.5 percent a year.

The strong performance of the U.S. economy is surprising given that the United States is a high-income country. There is some tendency for lower-income countries to grow faster because they can profit from technologies whose costs of development have been borne by higher-income countries. But the United States already had the highest income of the large industrial nations in 1990, so the U.S. economy grew fastest despite the costs of technological leadership.

Why has the United States grown faster than other large industrial economies? The previous section explained how the economic environment makes a difference. In many respects, the institutions and policies of the seven largest industrial economies are similar. All are stable democracies with mature legal systems capable of protecting property rights. During the 1990s, inflation in all has been low and relatively stable. With the possible exception of Japan, all are relatively open economies with similar trade policies. Each has a well-educated labor force. These characteristics also apply to the other long-time members of the Organisation for Economic Co-operation and Development (OECD), a sort of “rich countries club.”

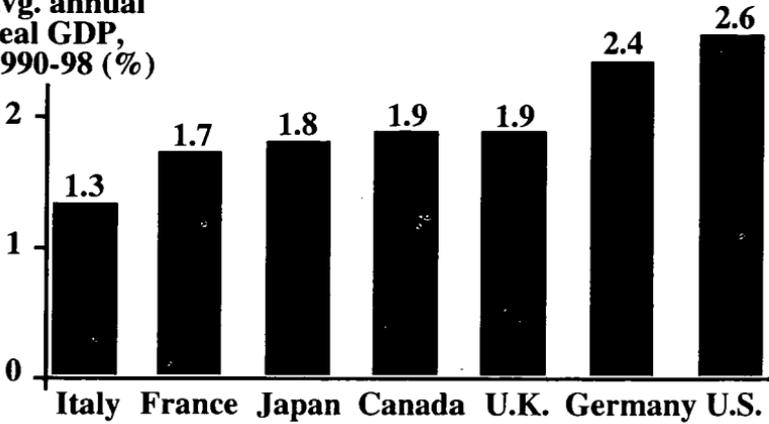
The economic environments of the large industrial countries do, however, differ in three major areas that influence economic growth: size and growth of government, regulation of labor markets, and attractiveness of the economy to entrepreneurs.

I. Size of Government and Economic Growth

The size of government is smaller and its growth has been more modest in the United States than in other high-income countries. Consider the evidence on the link between size of government and economic growth. As the upper part of Figure 3.2 indicates, seven long-time OECD members—Sweden, Denmark, France, Belgium, Austria, Finland, and Italy—had total government expenditures of 48 percent or more of GDP in 1998. Annual economic growth during the 1990s in these “big government” economies ranged from Sweden’s 1.1

Figure 3.1: Growth of the 7 Largest Industrial Economies During the 1990s

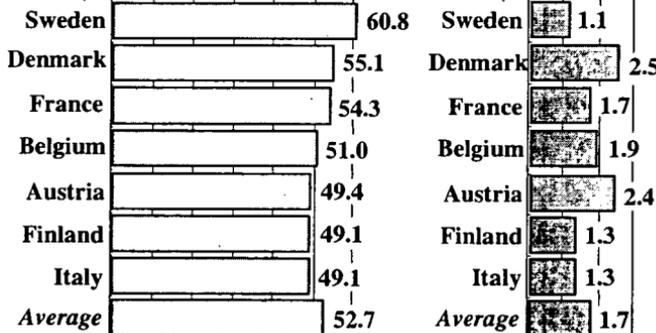
Growth of
avg. annual
real GDP,
1990-98 (%)



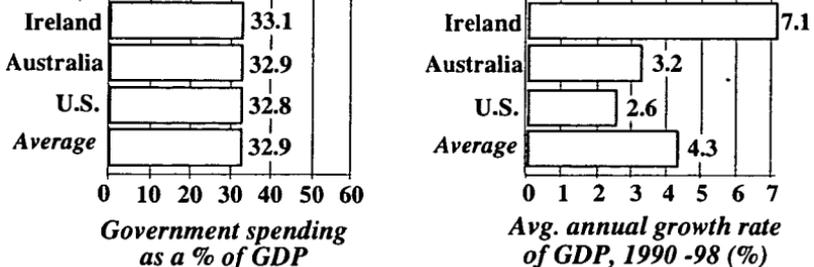
Sources: OECD Historical Statistics: 1960-94; OECD Economic Outlook, June 1999.

Figure 3.2: Economic Growth of OECD Countries, Big Government Versus Small Government

Countries with government spending > 48% of 1997 GDP



Countries with government spending < 35% of 1997 GDP



Sources: OECD Historical Statistics: 1960-94; OECD Economic Outlook, June 1999.

percent to Denmark's 2.5 percent. The average growth of the seven nations was 1.7 percent. By way of comparison, three long-time OECD members—Ireland, Australia, and the U.S.—had total government expenditures of less than 35 percent of GDP in 1998. Annual economic growth in these “smaller government” economies ranged from 2.6 percent in the United States to 7.1 percent in Ireland. Their group average was 4.3 percent, more than twice the average for the big government group. The highest growth rate among the big government group—Denmark's 2.5 percent—was slightly below the lowest rate among the small government group.

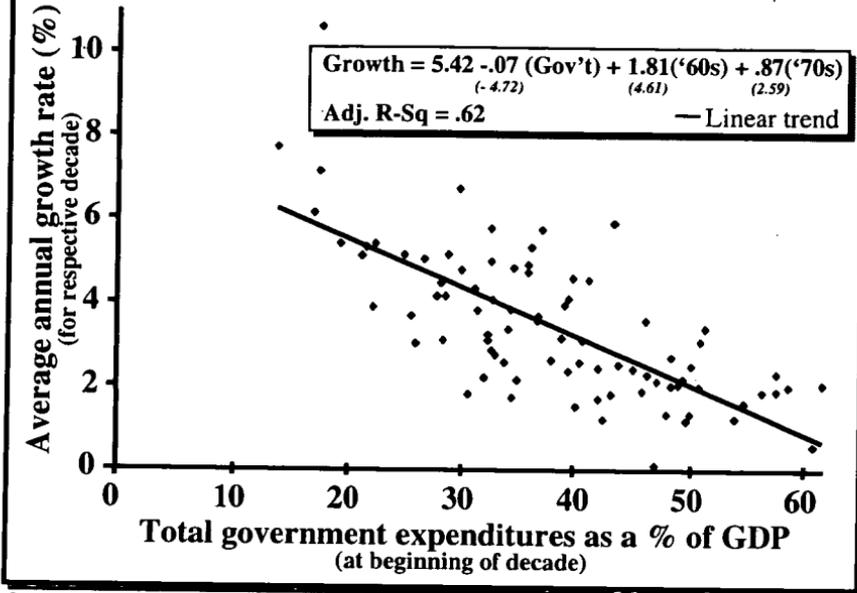
Figure 3.3 looks at the relationship between the size of government and growth over a longer period—the last four decades. The size of government *at the beginning of a decade* is measured on the horizontal axis, while the growth of real GDP *during that decade* is measured on the vertical axis. The graph contains four dots for each of the 21 OECD members on which data were available. The plot shows a clear relationship: slower growth is associated with more government spending.¹³

In the 1960s and 1970s, government spending as a share of GDP ranged from a low of around 15 percent to a high of more than 60 percent. The dots representing low levels of government—less than 20 percent of GDP—are either almost on the regression line or well above it. There is therefore no evidence that government expenditures were too small to maximize growth in any of these countries. Put another way, the evidence indicates that all of these countries were to the right of point B on the curve in Figure 2.3.¹⁴

¹³The equation in Figure 3.3, known as a regression equation, expresses the relationship numerically. The equation includes “dummy variables” (adjustment factors) for the data points in the 1960s and 1970s to take into account that growth rates then were significantly different than during other decades. The variable for the size of government is significant at the 99 percent level, meaning that there is only a 1 percent possibility that such a result could have been generated purely by chance. The coefficient is $-.07$, meaning that a 10 percentage point increase in size of government as a share of GDP reduces the long-term annual growth rate of real GDP by seven-tenths of a percent. The R^2 statistic indicates that the variable for the size of government and the dummy variables for the 1960s and 1970s “explain” 62 percent of the variation in growth among the 21 countries involved.

¹⁴For additional details, see James Gwartney, Robert Lawson, and Randall Holcombe, “The Size and Functions of Government and Economic Growth,” Joint Economic Committee, April 1998, available online at <http://www.house.gov/jec/growth/function/function.htm>; Edgar Peden, “Productivity in the United States and Its Relationship to Government Activity: An Analysis of 57 Years, 1929-1986,” *Public Choice*, v. 69 (1991), pp. 153-73; and Gerald Scully, *What Is the Optimal Size of Government in the*

Figure 3.3: Economic Growth Declines as Size of Government Increases, 1960 - 1998



Source: Derived from *OECD Historical Statistics: 1960-1994* and *OECD Economic Outlook*, June 1999. This analysis is based upon 84 observations (21 OECD countries for which data were available times 4 decades).

During the last four decades, the size of government has expanded in every OECD country, while the rate of growth in every country, with the exception of Ireland, has fallen. However, there has been considerable variation in the magnitude of government expansion. If big government retards long-term growth, as Figures 3.2 and 3.3 imply, the countries with the largest *increases* in government should experience the sharpest *reductions* in growth.

Since 1960, the size of government as a share of GDP has increased 20 percentage points or more in six long-time OECD countries: Denmark, Finland, Greece, Portugal, Spain, and Sweden. On the other hand, it has increased 10 percentage points or less in four long-time OECD countries: Iceland, Ireland, the United Kingdom, and the United States. Figure 3.4 presents data on the growth rates of these two groups, along with the average for OECD countries (bottom line of the table). Among the "rapid expansion in government" group, the

United States? (Dallas: National Center for Policy Analysis, 1994). While the methods employed by each study were different, all found that the growth-maximizing size of government was considerably smaller than the actual size of government in all OECD countries.

Figure 3.4: Economic Growth in OECD Countries with Most and Least Expansion in Size of Government

<i>Countries with least growth in size of gov't as a share of GDP (< 10%)</i>	Gov't as a % of GDP			Growth rate of real GDP (% per year)		
	1960 (1)	1998 (2)	Change (3)	'60-'65 (4)	'90-'98 (5)	Change (6)
Iceland	28.2	36.2	8.0	4.5	2.3	-2.2
Ireland	28.0	33.1	5.1	4.1	7.1	3.0
United Kingdom	32.2	40.2	8.0	3.5	1.9	-1.6
United States	28.4	32.8	4.4	4.4	2.6	-1.8
Average	29.2	35.6	6.4	4.1	3.5	-0.6
<i>Countries with most growth in size of gov't as a share of GDP (> 20%)</i>						
Denmark	24.8	55.1	30.3	5.9	2.5	-3.4
Finland	26.6	49.1	22.5	5.6	1.3	-4.3
Greece	17.4	41.8	24.4	7.2	1.7	-5.5
Portugal	17.0	43.6	26.6	6.5	2.7	-3.8
Spain	13.7	41.8	28.1	8.5	2.2	-6.3
Sweden	31.0	60.8	29.8	4.9	1.1	-3.8
Average	21.8	48.7	27.0	6.4	1.9	-4.5
Average for 21 OECD countries*	27.3	44.3	17.0	5.6	2.4	-3.2

Sources: Derived from *OECD Historical Statistics* and *OECD Economic Outlook* (various issues).

Note: *All countries for which data were available in the sample period were included. The countries are U.S., Japan, Germany, France, Italy, U.K., Canada, Australia, Austria, Belgium, Denmark, Finland, Greece, Iceland, Ireland, Netherlands, New Zealand, Norway, Portugal, Spain, and Sweden.

average annual growth of real GDP fell from 6.4 percent in 1960-65 to 1.9 percent in the 1990s, a drop of 4.5 percentage points. Among the "slower expansion in government" group, the average annual growth of real GDP fell from 4.1 percent in 1960-65 to 3.5 percent in the 1990s, a drop of only 0.6 percentage points. The best country in the "rapid expansion in government" group experienced a greater drop in growth

than the worst country in the “slower expansion in government” group.¹⁵

In 1960 government expenditures as a share of GDP for every country in the top part of Figure 3.4 exceeded the OECD average (bottom line of table) of 27.3 percent. At the same time, their average GDP growth rate of 4.1 percent was below the OECD average of 5.6 percent during the 1960s. The situation was exactly the opposite *for this same set of countries* in the 1990s. After their ratios of government expenditures to GDP dropped below the OECD average, their growth rates rose above the average.

The reverse happened to the nations in the bottom part of Figure 3.4. In 1960 their government expenditures as a share of GDP were below the OECD average, and their average GDP growth rates were higher than the OECD average. By 1998 their government expenditures had risen above the OECD average and their average growth rates had fallen below it. Because these statistics are for the same countries and country groupings, they are particularly revealing.

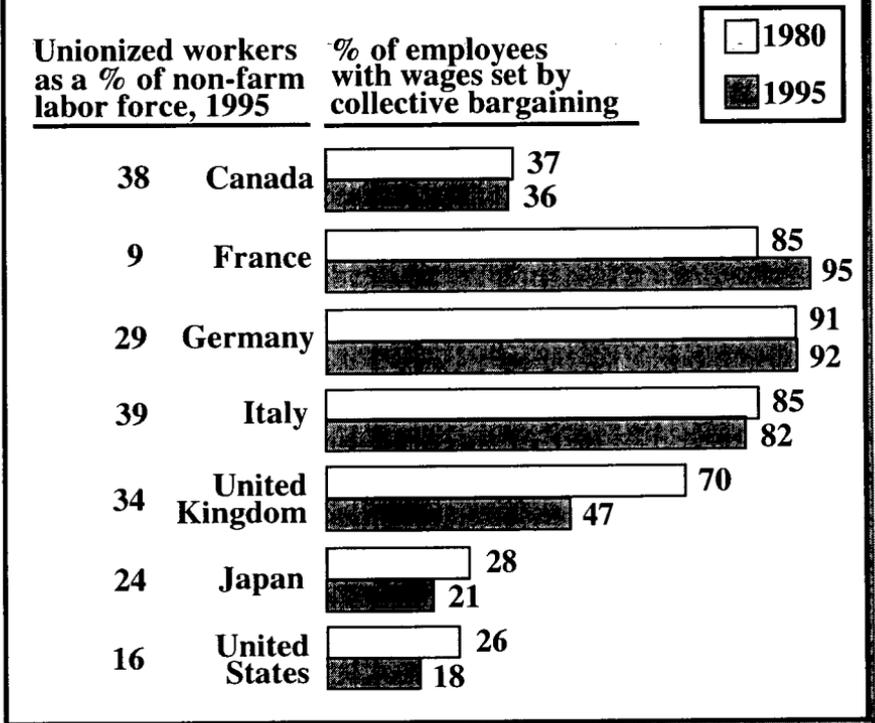
II. Labor Market Flexibility and Growth

Compared to other high-income countries, the United States has a labor market with less regulation and more wage flexibility. That makes it easier for employees to move among industries and occupations in response to changing conditions.

Several factors contribute to this flexibility. First, collective bargaining in the United States, Canada, and Japan is decentralized—it takes place at the company or plant level. In contrast, wage-setting is highly centralized in Western Europe, where negotiations between a union (or federation of unions) and an association of employers set wages in various industries, occupations, or regions. Even the wages paid to nonunion employees by non-association employers are determined by these negotiations. Therefore, as Figure 3.5 indicates, the number of workers whose wages are set by collective bargaining is far greater than union membership in France, Germany, and Italy.

¹⁵While the growth of government in Japan was slightly less than 20 percentage points, it is revealing nonetheless. At the beginning of the 1960s, government spending was only 17.5 percent of GDP, and it averaged only 22 percent of GDP during the decade. With small government, the Japanese economy registered an average annual growth rate of 10.4 percent in the 1960s. Over the next three decades, the Japanese government grew steadily; by 1998 government spending was 36.9 percent of GDP. Average annual economic growth fell to 5.3 percent in the 1970s, 3.8 percent in the 1980s, and 1.6 percent in the 1990s.

Figure 3.5: Share of Employees with Wages Set by Collective Bargaining



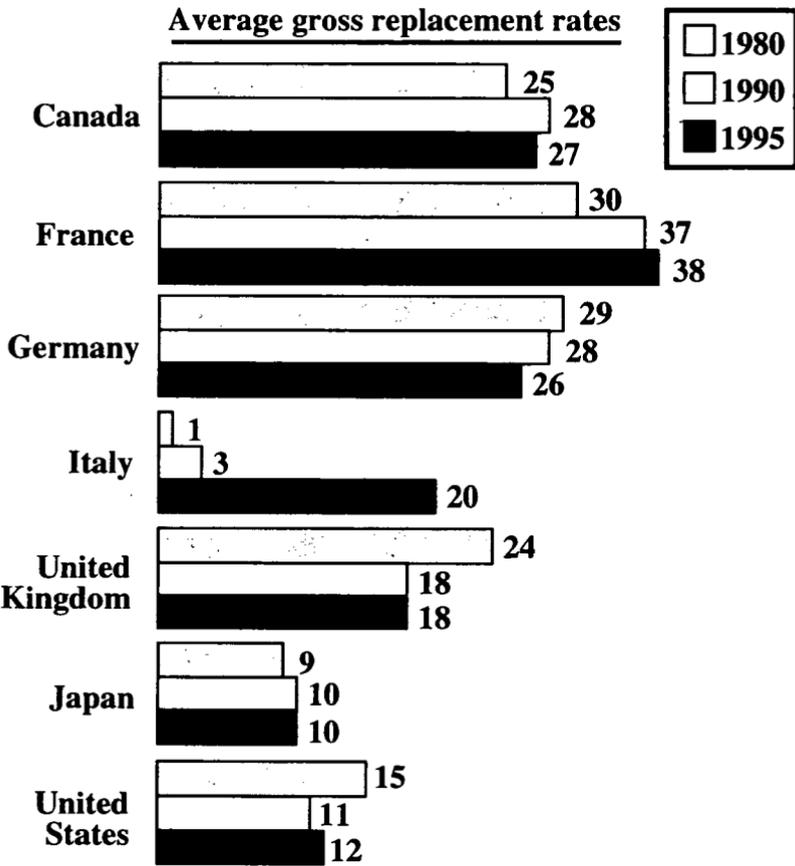
Sources: OECD, *Employment Outlook*, July 1994, Table 5.7; OECD, *Employment Outlook*, July 1997, Table 3.3; and OECD, *Country Surveys* (various issues).

Nationwide wage-setting reduces the flexibility of wages across occupations, industries, and regions.

Second, Western European countries have regulations mandating lengthy periods of prior notification or months of severance pay for dismissing workers. Firms are often required to obtain approval from the government to dismiss workers. While the stated objective of these regulations is to enhance job security, they make entry into the labor force more difficult. Because it is more costly to dismiss workers, it is more costly to hire them. When dismissal is costly, employers are reluctant to add workers even during periods of strong demand. Countries with highly restrictive dismissal regulations also have high rates of unemployment, particularly among young workers seeking to enter the labor force.

Finally, generous unemployment benefits and other transfers to the able-bodied unemployed reduce the cost of being unemployed. People

Figure 3.6: Replacement Rate of Unemployment Benefits



Sources: OECD, *OECD Jobs Strategy: Making Work Pay* (1997), Figure 2; OECD, *Implementing the OECD Jobs Strategy: Member Countries' Experience*, Table 5.

respond with longer periods of job search, causing the unemployment rate to rise. Overly generous benefits offer an alternative to work, reducing output by idling workers.

Figure 3.6 shows the replacement rate, which is the size of the average unemployment benefit expressed as a percentage of the wages a person earned when employed. Unemployment benefits in Western Europe and Canada are far more generous than in Japan and the United States. Throughout the 1990s, unemployment in France, Germany, Italy, and Canada has been 4 to 8 percentage points higher than in Japan and United States. High unemployment in those countries is not

due to cyclical factors; rather, it reflects the structure of their labor markets.¹⁶

The United Kingdom illustrates what labor market reform can do to unemployment. During the 1980s, various reforms made labor markets more competitive. At the same time, unemployment benefits were scaled back. Increasingly, the unemployment rate in the United Kingdom resembles that of the United States rather than other Western European countries.¹⁷

III. Entrepreneurship and Growth

The United States has a business climate that is relatively favorable to entrepreneurship. As we will discuss later, taxation on savings and capital formation are high. In other respects, however, the U.S. economy provides opportunity for entrepreneurs. In particular, the capital markets in the United States are more open than in most other countries. The U.S. capital market is the largest in the world. It provides entrepreneurs with a wide variety of sources for financial capital. A number of financiers specialize in providing venture capital—start-up funds for high-risk but potentially high-reward business activities. For companies that wish to tap investment from the public directly, U.S. stock markets offer well-developed channels for doing so. The practice of offering stock options to employees, as a way of encouraging entrepreneurial behavior within companies, is more highly developed in the U.S. than in other countries. The encouragement of aggressive entrepreneurial behavior has been an important source of recent economic growth, particularly in the high-technology sector.

¹⁶For additional details, see Edward Bierhanzl and James Gwartney, "Regulation, Unions, and Labor Markets," *Regulation*, v. 21 (Summer 1998), pp. 40-53.

Unemployment benefit systems are complex. Initial replacement rates among the large industrial economies are quite similar. However, Western European countries generally permit workers to draw benefits for longer than the United States does. Replacement rates often vary with the previous level of earnings, family size and situation, the previous length of employment, and the duration of unemployment. The OECD has calculated the replacement rates in member countries for recipients at two different income levels, three family situations, and three time periods of unemployment. The average replacement rates for these 18 different categories provide a reasonably good estimate of cross-country variations in the average replacement rate. The replacement rates of Figure 3.6 were derived by this method.

¹⁷In the summer of 1999, unemployment in the United Kingdom was 6.1 percent, versus 10.5 percent in Germany, 11 percent in France, and 12 percent in Italy. Figures are OECD standardized measures of unemployment.

IV. Conclusion

There is abundant evidence that secure property rights, competitive markets, price stability, openness to international trade, and smaller government enhance economic growth. If the United States is to achieve its full potential, it must diligently pursue these objectives. The experience of Western Europe is that big government—high government expenditures and extensive regulation—leads to sluggish growth.

4. A CASE STUDY IN RAPID GROWTH: IRELAND

The experience of Ireland in the last four decades offers a case study in how much difference the right policies can make to economic growth.

I. Ireland's U-Turn

From the early 1960s to the mid 1980s, the Irish government followed policies that hampered economic growth. Government spending rose from 28 percent of GDP in 1960 to 43 percent in 1974 and 52.3 percent in 1986.¹⁸ Taxes were high, monetary policy was unstable, and trade restraints limited international exchange. By the mid 1980s, Ireland was on the verge of collapse. Real growth had fallen sharply. Unemployment soared to more than 17 percent during 1985-87. People were leaving the country in search of opportunity.

Out of desperation, the Irish government began to shift policy. Government spending was sliced, tax rates were lowered, monetary policy became more stable, and trade became more open.

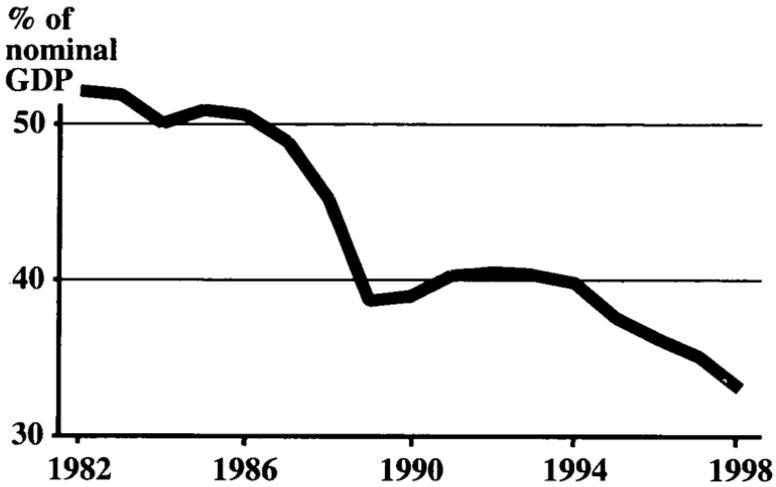
1. Smaller government. By the mid 1980s, government spending was out of control and the size of the government debt was expanding rapidly, peaking at 120 percent of GDP in 1986. An attempt in 1983 to balance the budget by raising taxes had failed, throwing the economy into recession and leading to even higher levels of government debt. Finally, in 1987, the Irish government decided to try the alternative approach of reducing government spending. Government employment was cut by about 10 percent between 1986 and 1989.¹⁹ As Figure 4.1 shows, total government outlays fell from 50 percent of GDP in 1986 to less than 40 percent in 1989. They have continued to recede in the 1990s, reaching 33.1 percent of GDP in 1998. The improvement in the budget situation reduced interest rates and led to increased confidence in the Irish economy, which created more investment.

2. Lower tax rates. As the size of government shrank, the tax burden on both individuals and businesses was systematically reduced. As Figure 4.2 shows, the top marginal rate imposed on personal income was sliced from 65 percent in 1984 to 58 percent in 1986 to 48 percent in 1992. Most recently, it has been reduced to 46 percent. Corporate tax rates have also been reduced sharply, from the top rate of

¹⁸Figures are from *OECD Historical Statistics: 1960-1994* (Paris: Organisation for Economic Co-Operation and Development, 1996), Table 6.5.

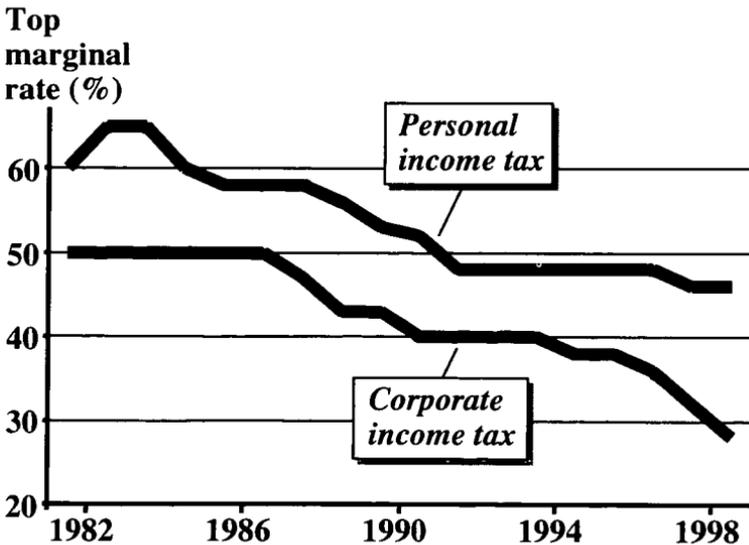
¹⁹Alberto Alesina and Roberto Perotti, "Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects," National Bureau of Economic Research Working Paper W5730 (1996), p. 25.

Figure 4.1: Ireland's Government Outlays as a Share of GDP



Source: *OECD Economic Outlook*, 1999.

Figure 4.2: Ireland's Top Marginal Tax Rates



Source: Price Waterhouse, *Individual Taxes: A Worldwide Summary* (various issues).

50 percent in 1987 to the current rate of less than 30 percent. The reductions have increased incentives to work, invest, and innovate.

3. Sound monetary policy. Monetary policy has improved substantially since the late 1980s. Ireland's annual rate of inflation has fallen and become more stable (Figure 4.3). Since 1987, inflation has averaged 2.5 percent a year, down from an average of 12.7 percent a year from 1970 to 1986.

4. Openness to international trade. When Ireland joined the European Union (EU) in 1973, it was required to harmonize its trade policy with that of the EU over the next decade. Ireland benefited from free trade within the EU and from EU tariff rates being lower than the rates previously imposed by the Irish government. The increased openness of the Irish economy propelled exports from 50 percent of GDP in 1980 to 60 percent in 1990 and 84 percent in 1997. Once heavily dependent upon neighboring Britain as a trading partner, Ireland's trade is now more diversified. Britain now accounts for only 27 percent of Irish exports, down from 47 percent in 1979.

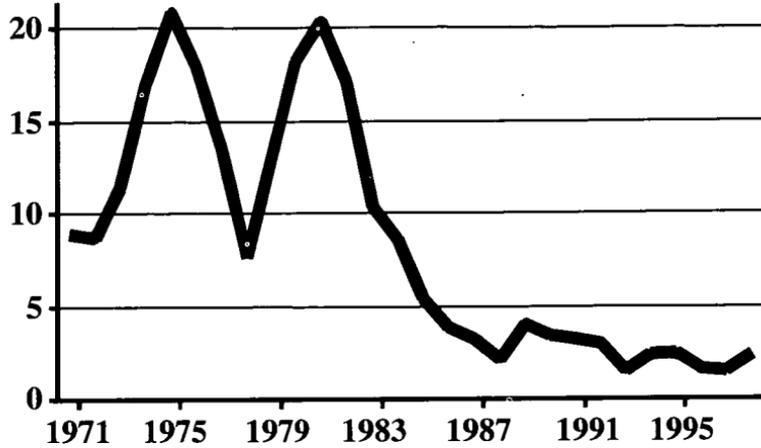
II. The Impact of the Policy Changes

What impact have these policies had on the Irish economy? The turnaround since the late 1980s has been remarkable. As Figure 4.4 shows, the annual growth rate of real GDP rose from 2.3 percent in 1982-87 to 4.8 percent in 1988-93. From 1994 to 1998 the Irish economy grew 8.9 percent a year. Ireland's growth rate has been the strongest by far in Europe during the 1990s. Certainly, the Irish experiment reinforces the view that open and competitive markets, reduction in the size of government, lower tax rates, and stable monetary policy matter—indeed, they matter a great deal.

The lone blemish on Ireland's economic record is unemployment. Ireland's unemployment rate has fallen from its 17 percent rate in the late 1980s to 6.6 percent today. This compares favorably with the EU average of 10.2 percent, but it is still about half again as high as the rate of the United States. Irish unemployment benefits are still quite generous and the labor market would profit from additional deregulation. Nonetheless, the overall picture is a remarkable success story.

Figure 4.3: Ireland's Inflation

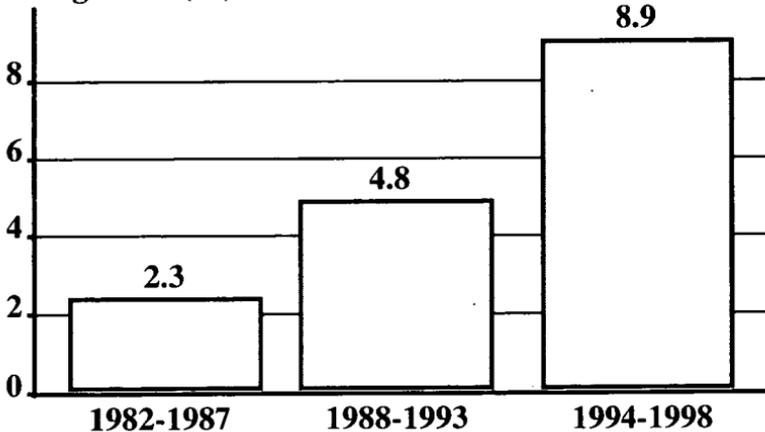
Annual
change
in CPI (%)



Source: *OECD Economic Outlook*, 1999.

Figure 4.4: Ireland's GDP Growth

Annual real
GDP growth (%)



Source: *OECD Economic Outlook*, 1999.

5. RECORD AND PROSPECTS OF THE U.S. ECONOMY

I. Growth of the U.S. Economy Since 1945

Compared to other large industrial nations, the United States has had impressive economic growth during the 1990s. However, the growth is much less impressive when compared with the 25 years following World War II. Growth during the 1950s and 1960s was considerably more robust than it has been during the 1990s.²⁰ Moreover, the case of Ireland suggests that the 1990s have no special characteristics that have made it inevitably a period of slower growth. Faster growth is achievable if the right policies are in place.

Figure 5.1 presents data on the growth rates of real GDP, productivity, and real hourly compensation. To highlight long-term growth rather than short-term cyclical movements, the data are 32-quarter moving averages: each observation shows the average growth rate over the previous eight years.

The growth rates of real GDP, productivity, and hourly compensation tend to move together, as one would expect. Real GDP measures total output, while productivity measures output per hour. When productivity changes, real GDP tends to change in the same direction. Productivity growth provides the basis for increases in compensation. Therefore, when productivity rises or falls, so does hourly compensation.

The growth rates of real GDP, productivity, and hourly compensation were all higher in the 1960s and early 1970s than during the last 25 years. The long-term growth rates of productivity and hourly compensation fell in the 1970s and have remained on a lower plateau since. All three indicators have been rising during the last few years, but remain well below the rates of the 1960s and early 1970s.

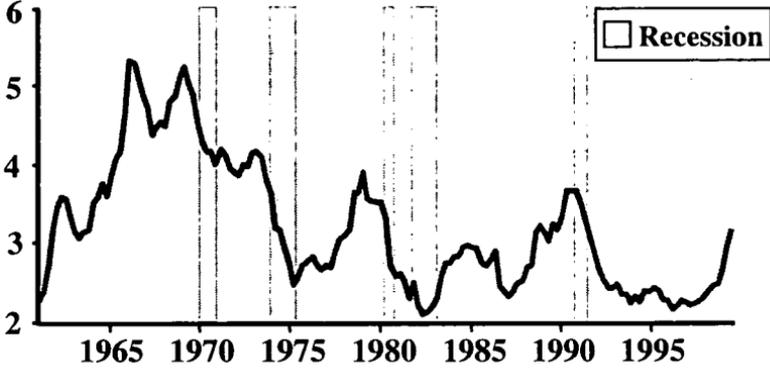
All of this raises a question that is crucial for the U.S. economy and for the federal government: Is the increase in the long-term growth rate since 1995 merely a temporary phenomenon, or is it a more permanent movement?

²⁰During the 25-year period 1949 to 1973, the average annual growth rate of real GDP was 3.9 percent. During the last 25 years (1974 to 1998) the average growth rate was 2.7 percent. Growth rates of real GDP in recent decades have been as follows: 1960-69—4.4 percent; 1970-79—3.2 percent; 1980-89—2.7 percent; 1990-98—2.6 percent.

Figure 5.1: Growth of Real GDP, Productivity, and Hourly Compensation

Growth of real GDP (%)

(32-quarter moving average)



Growth of output per hour (%)

(32-quarter moving average)



Growth of real hourly compensation (%)

(32-quarter moving average)



Sources: Haver Analytics; *Economic Report of the President*, 1999.

II. Demographic Changes and Economic Growth

Changes in the age profile of the population affect both the level of income and its growth. Most people spend their twenties and early thirties developing skills through higher education, training, and job experience. During this phase, their productivity and earnings are generally below average. When people approach retirement, their productivity often declines because of worsening health and because their job skills may not be as up-to-date as they once were. Thus, the productivity and earnings of people over 60 are also generally below average. People 35 to 59 generally have the combination of education, experience, and health that results in the highest levels of productivity. Earnings figures confirm that the average real earnings of individuals reach a peak during these years.

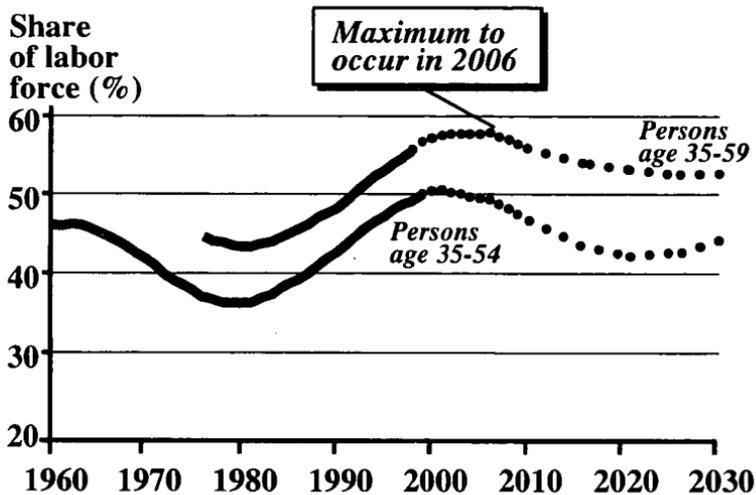
An increase in the share of the population 35 to 59 years old tends to push average productivity and earnings upward. When workers 35 to 59 are expanding as a share of the labor force, it enhances the growth of productivity and output. In contrast, an increase in the share of the population younger or older tends to retard growth.

The top frame of Figure 5.2 shows the percentage of the labor force ages 35 to 54 since 1960, and ages 35 to 59 from 1977 forward. The share of these groups fell by almost 10 percentage points from 1965 to 1980. This trend reversed during the 1980s as the “baby boom” generation entered its prime working years. During the last decade, the percentage of the labor force ages 35 to 54 rose from 40 percent to 50 percent. Currently, approximately half of the U.S. labor force is 35 to 54 years old, up from only 36 percent in 1980. The share of the labor force in the prime-age category will not change much during the next decade, but in about 15 years it will begin to shrink, and by 2020 it will return to the levels of the late 1980s.

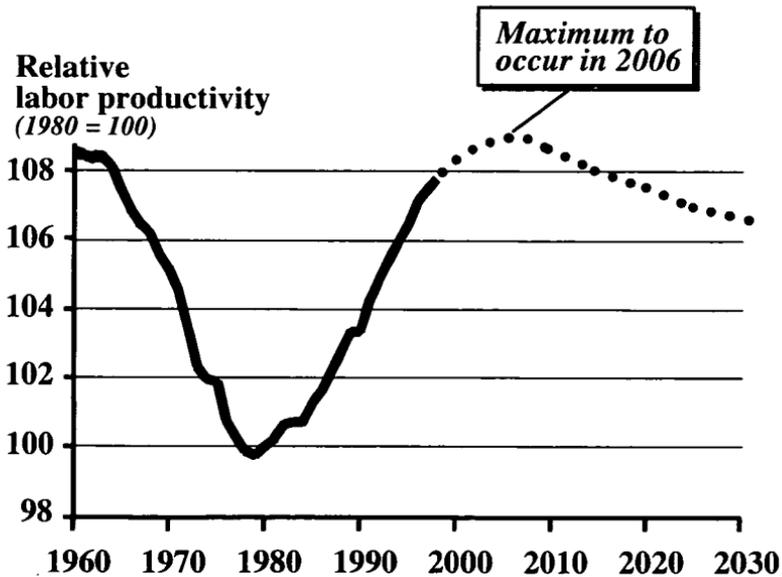
What do these demographic trends have to do with economic growth? The bottom frame of Figure 5.2 shows how the changing age composition of the labor force during the last several decades has influenced average productivity. The influx of youthful, inexperienced workers accompanying the entry of the baby boom generation into the labor force between 1960 and 1980 reduced average productivity by about eight percentage points. This negative impact on productivity—and its growth—was particularly sharp during the 1970s.

The impact reversed during the 1980s, and in the 1990s the rapid growth of prime-age workers has boosted both productivity and its growth. Between 1991 and 1998, the growth of prime-age workers as a share of the labor force increased average productivity by a total of four percentage points. On an annual basis, this factor alone added

Figure 5.2: Impact of Demographics on Labor Productivity and Growth



(a) 'Prime-age' workers



(b) Effect of changing demographics on labor productivity

approximately one-half of a percentage point to the growth rate of productivity from 1991 to 1998.²¹

Prime-age workers will continue to comprise a large share of the labor force during the decade ahead. However, when the baby boom generation starts retiring around 2010, the situation will change dramatically. During the decade following 2010, the number of retirees will increase sharply, while the share of the prime-age workers will fall.²² This combination will be a drag on the growth of the economy during the second and third decades of the next century.

III. The Slowdown of Growth During the 1970s

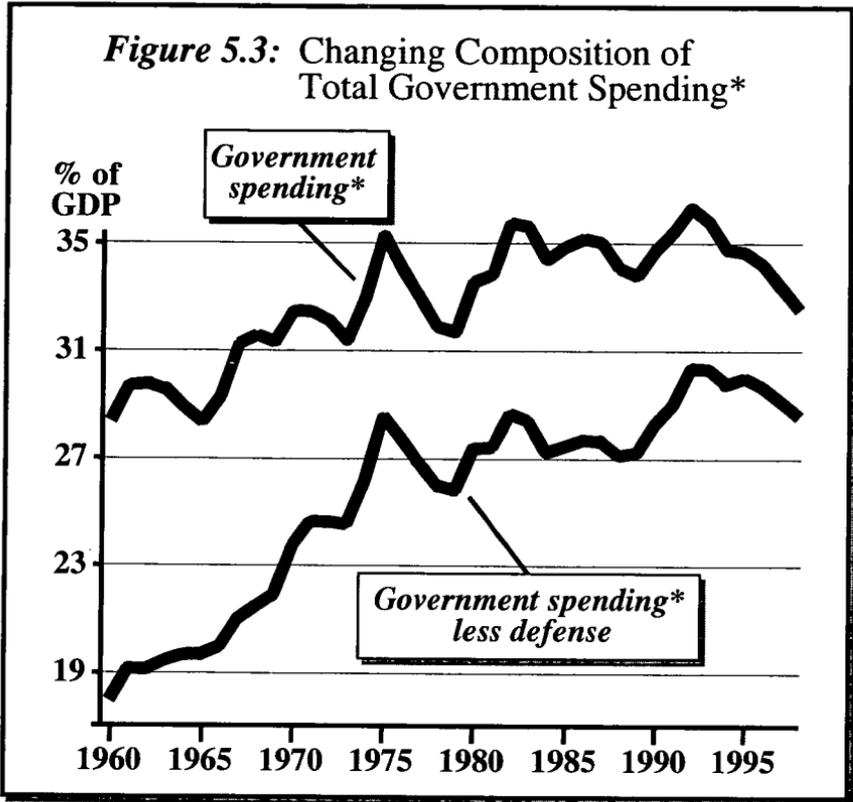
The growth rates of real GDP, productivity, and hourly compensation fell sharply in the 1970s. Demographic changes—specifically the entry of numerous youthful, inexperienced workers into the labor force—adversely affected productivity. Sharp increases in the price of oil in 1973 and 1981 also contributed to the slowdown,

²¹The productivity index in the bottom frame of Figure 5.2 was derived by weighting the age-earnings profile for males in 1998 by the percent of the labor force in each age category for each year in the data set. Mathematically, the ratio for each of the “i” years is equal to the sum of $(P_{a98} \times A_{ai})$ divided by the sum of $(P_{a98} \times A_{a80})$, where P_{a98} is equal to the 1998 annual earnings within each of the “a” age categories (e.g. 20-24, 25-29, and so on), A_{ai} is the percent of the labor force in each age cell during the ith year, and A_{a80} is the percent of the labor force in each age cell during the 1980 base year. The ratio was derived for each year.

For 1960 to 1998, the number of persons with earnings in each age cell was used to derive the share of the labor force in the age cell. For years beyond 1998, the representation in each age cell is based on population projections. Our projections (based upon U.S. Census Bureau forecasts of population growth) assume that the rate of labor force participation in each age category will remain the same as it was in 1998. When the share of the labor force in the high-earnings (productivity) age categories is large relative to the 1980 base year, the ratio will be greater than 100. Increases (reductions) in the share of the labor force in the prime-earnings age groupings will cause the ratio to rise (fall). The index estimates the amount by which earnings, and thus productivity, differ from the 1980 base year as the result of changes in the age composition of the labor force. Data before 1976 use ten-year age categories instead of the five-year categories present in the rest of the data.

²²The number of Americans over age 70 is projected to increase from 27.3 million in 2010 to 34.8 million in 2020 and 47.8 million in 2030. *Bipartisan Commission on Entitlement and Tax Reform, Final Report to the President* (Washington: Government Printing Office, 1995), p. 13; *1995 Annual Report of the Board of Trustees of the Federal Old Age and Survivors Insurance and Disability Insurance Trust Funds* (Washington: Government Printing Office, 1995), p. 21.

Figure 5.3: Changing Composition of Total Government Spending*



Sources: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, March 1998; *Economic Report of the President*, 1999.

Note: *Government spending is composed of federal, state, and local expenditures and investment.

by reducing the efficiency of vast amounts of capital. Many machines and structures designed for cost effectiveness at pre-1973 energy prices were too costly to operate at higher prices. Energy prices fell throughout most of the 1980s, but initially people were not sure whether lower energy prices were temporary or more permanent. It took time to adjust to the new situation, so growth did not immediately rebound.

In addition to the unfavorable impact of demographic changes and higher energy prices, inappropriate policies also contributed to the fall in the growth rate during the 1970s. Monetary policy was unstable: both the rate and volatility of inflation rose throughout the decade. It takes time to regain lost credibility, and even though inflation declined during the 1980s, the adverse consequences of the earlier monetary and price instability lingered. The growth of government also played a role in the slowdown. As Figure 5.3 shows, total government expenditures (federal, state, and local) rose from less than 29 percent of GDP in

1965 to more than 35 percent in 1975. They fluctuated around this high level from 1975 to 1990.²³

IV. The Underpinnings of Growth During the 1990s

While the long-term growth rate of the U.S. economy remains below the levels achieved during the 25 years following World War II, there are signs that it is increasing. The 32-quarter average annual growth rates of real GDP, productivity, and hourly compensation have all increased sharply during the last few years. Just as the slowdown of the 1970s reflected several negative factors, the improved performance of the U.S. economy during the 1990s is the culmination of several positive developments.

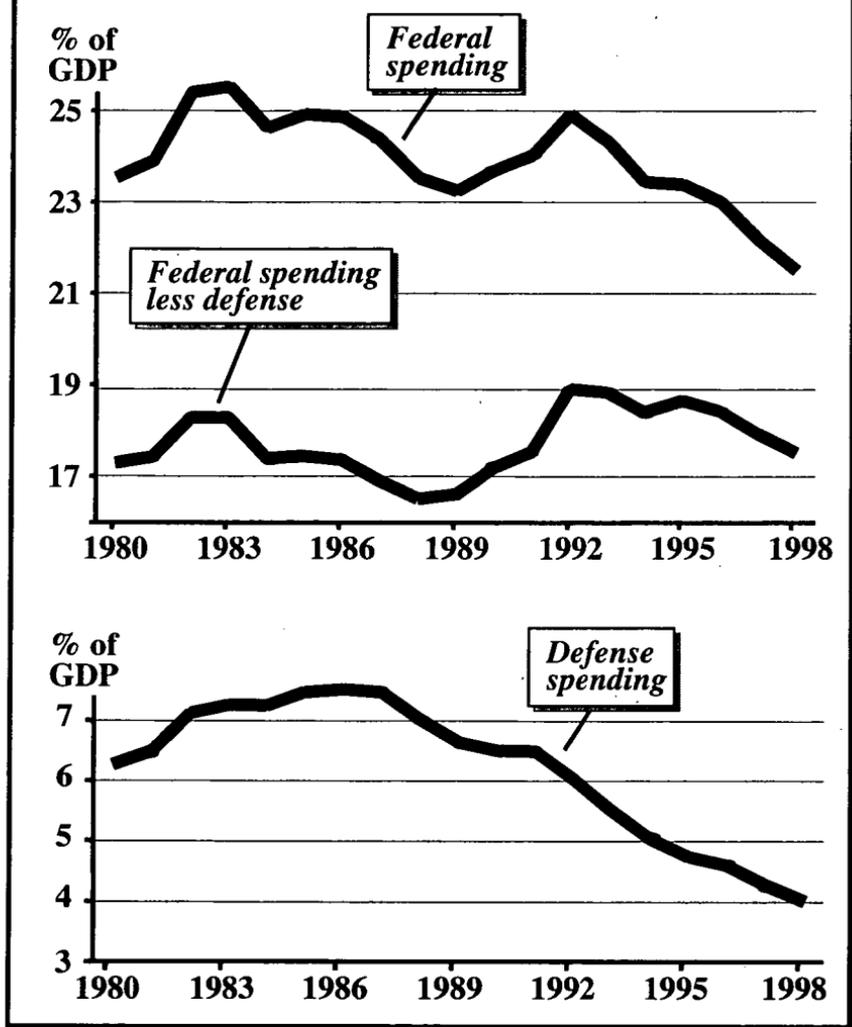
1. Monetary and price stability. Monetary policy since 1982 has achieved low, stable inflation. As the Federal Reserve has kept the inflation rate low and stable, it has regained credibility it lost in the 1970s. People are now more confident that the Federal Reserve will follow policies consistent with price stability. That helps keep interest rates low and reduces the uncertainties accompanying investment and other choices that involve income and costs across time periods.

2. Lower defense spending and smaller government. During the 1990s, there has been a modest reduction in government spending as a share of the economy. It has fallen from approximately 35 percent of GDP in 1991-1993 to less than 33 percent in 1998. As Figure 5.4 shows, federal spending fell from 25 percent of GDP in 1992 to less than 22 percent in 1998. The primary factor responsible for the decline has been lower defense spending now that the Cold War has been won. Defense spending fell from 7.5 percent of GDP in 1986-1987 to 4 percent in 1998. Had it not fallen, government spending as a share of the economy would have remained virtually unchanged during the 1990s.

3. Lower trade barriers. Numerous countries have reduced their trade barriers during the last 15 years. The United States has modestly reduced barriers, particularly those that apply to trade with Canada and Mexico. Following on the heels of the U.S.-Canadian Free Trade Agreement of 1988, the North American Free Trade Agreement (NAFTA) took effect in 1994. As the result of these two agreements, trade now flows more freely among the three largest North American nations. By 2004, tariffs on most products among these three countries

²³The data of Figure 5.3 on government expenditures include capital expenditures as well as government consumption and transfer payments. Government investment is often omitted from data purporting to give "total government expenditures."

Figure 5.4: Changing Composition of Federal Spending



Sources: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, March 1998; *Economic Report of the President*, 1999.

will be phased out. Restrictions on financial investments and trade in services such as banking are also being removed.

Responding to lower trade barriers and reductions in transport and communications costs, the U.S. trade sector has grown sharply. Since 1990, imports have risen from 10 percent of GDP to 16 percent. During the same period, exports have expanded from 9 percent of GDP to 14 percent. Trade is a positive-sum activity: both parties gain from it.

4. Favorable demographics. The sharp increase in the share of the labor force in the prime-age, high-productivity categories during the 1990s has enhanced productivity per worker. An increased share of the population in their peak earning years has also boosted government revenue. People 35 to 59 pay considerable taxes from their relatively high incomes but consume relatively few government services. In contrast, rapid growth in the number of young people increases government spending for education, while rapid growth in the number of the elderly increases government spending for Social Security and health care. In the 1970s, the presence of more children and young adults pushed government, particularly state and local governments, toward more spending. The presence of more people in their peak earning years in the 1990s has helped generate budget surpluses at all levels of government.

5. Welfare reform. In 1996, the federal government enacted sweeping welfare reforms. It ended the “entitlement” status of welfare, whereby anyone with children who had a sufficiently low income automatically qualified for federal benefits. States were given much greater latitude in setting eligibility requirements and time limits for those receiving benefits. Since 1994, the share of the U.S. population on welfare has fallen by almost half, a substantially larger reduction than can be attributed to the general strength of the economy.²⁴

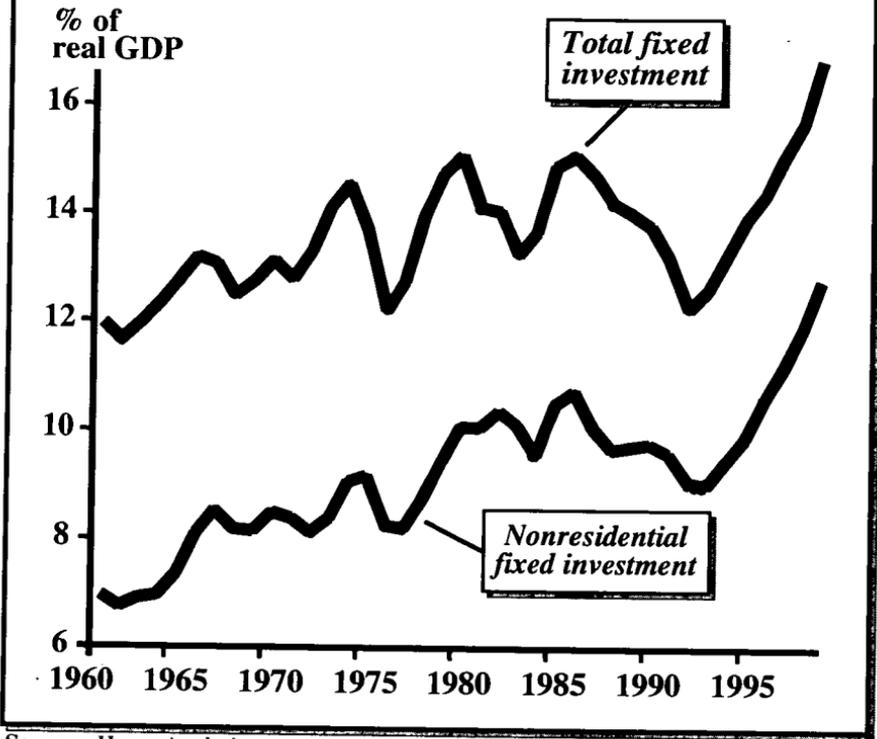
For the economy as a whole, the cost of hiring workers includes transfer payments as well as compensation directly paid to workers. By making work less attractive for those who face entering the labor force in low-paying jobs, transfer payments to the able-bodied unemployed tend to increase the unemployment rate. By reducing transfer payments to the able-bodied unemployed, welfare reform reduces the cost of hiring, thereby increasing private-sector hiring and economic growth. Once in the labor force, workers in low-paying jobs acquire skills that help them stay employed and move into higher-paying jobs, whereas if they remain unemployed they never acquire the skills. At least one study suggests welfare reform alone is responsible for a reduction in the unemployment rate of one percentage point.²⁵

Considering the favorable factors that emerged during the last few years — a sustained period of low inflation, increased trade, an increase in the relative number of persons in their prime earning years,

²⁴General economic growth only accounts for about 20 percent of the reduction in welfare caseloads since 1994, and less since 1996. *Economic Report of the President, 1999* (Washington: Government Printing Office, 1999), p. 119.

²⁵John Mueller, “The Answer to Three Puzzles: Welfare Reform Lowered Unemployment,” *LBMC Report* (Lehrman Bell Mueller Cannon, Inc., Arlington, Virginia), July 23, 1999.

Figure 5.5: Real Fixed Investment as a Share of GDP



Source: Haver Analytics.

and smaller government in the post-Cold War era — it would have been surprising if there had not been an increase in growth and productivity.

V. Future Prospects for the U.S. Economy

The U.S. economy expanded at an annual rate of 2.7 percent during the 1980s and 2.6 percent during the 1990s. This is less than the rates of the 1960s and 1970s. During the last five years, real GDP has grown at a 3.4 percent annual rate. Does the recent higher growth reflect primarily short-term cyclical factors or is it the beginning of more robust long-term growth? Two factors are emerging that should enhance the future growth of the U.S. economy: strong investment and leadership in high-technology industries.

1. Growth of real fixed investment. Figure 5.5 presents data on both total real fixed investment and nonresidential real fixed investment as a share of GDP during the last four decades. The

interesting thing is the recent strength of these numbers, particularly the figures for nonresidential fixed investment. During the current expansion, nonresidential fixed investment has risen from 8.9 percent to 12.7 percent of GDP. The latter figure is two percentage points higher than during any recent expansion.

Purchases of durable equipment, such as machines, have been the driving force underlying the rapid growth of investment. Real purchases of producers' durable equipment rose from \$389 billion in 1992 to \$770 billion in 1998—an unprecedented rate of growth (Figure 5.6). The investment trend of the 1990s is important because capital—more and better equipment—enhances the future productivity of workers. In turn, higher productivity per worker provides the basis for rapid growth of income.

2. Growth of the high-technology sector. Evidence is mounting that the United States is in the midst of a boom in high technology. Striking increases in growth have occurred in semiconductors, software, the Internet, and biotechnology. The size of the high-tech sector rose from 4.9 percent of GDP in 1985 to 6.1 percent in 1990 and 8.2 percent in 1998 (Figure 5.7). According to the U.S. Department of Commerce, information technology industries have generated about one-third of the recent growth of the U.S. economy.²⁶

The United States occupies a position of world leadership in high technology. As Figure 5.8 shows, personal computer usage in the United States is substantially greater, both absolutely and per person, than in Western Europe and Japan. The U.S. has over half of the world's Internet users and more than 60 percent of the world's Internet host computers.²⁷

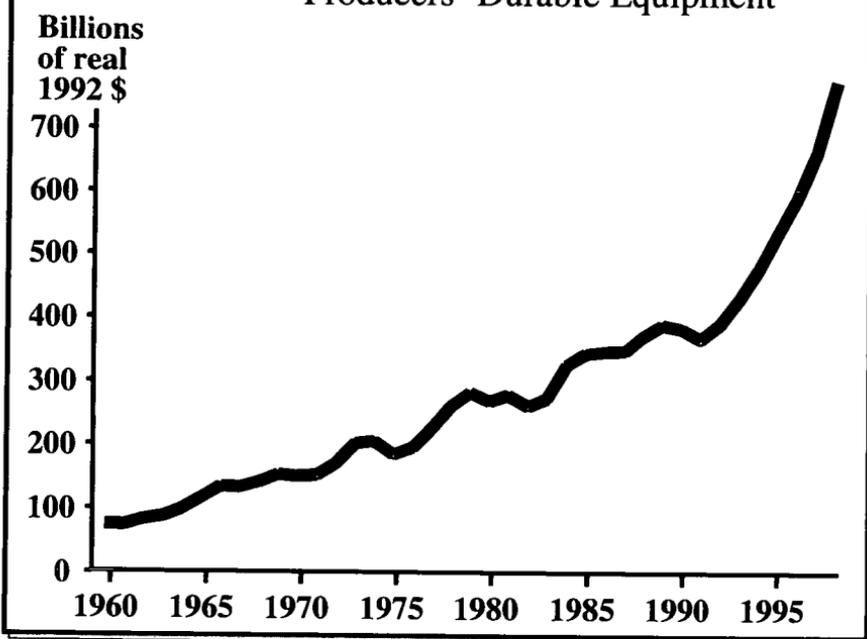
Consumer applications of the World Wide Web such as book selling and stock trading are well known, but business-to-business electronic commerce on the Web is much larger and potentially more important for economic growth. Web connections to suppliers and customers are promoting faster, more accurate, and lower-cost transactions throughout the economy.²⁸

²⁶See *The Emerging Digital Economy* (Washington: U.S. Department of Commerce, 1998).

²⁷In the United States, 48 percent of the population uses personal computers, versus 26 percent in Japan and 22.5 percent in Western Europe. In the United States, 29 percent of the population uses the Internet, versus 8 percent in Japan and 7 percent in Western Europe. (These calculations are based on figures from *Computer Industry Almanac*.)

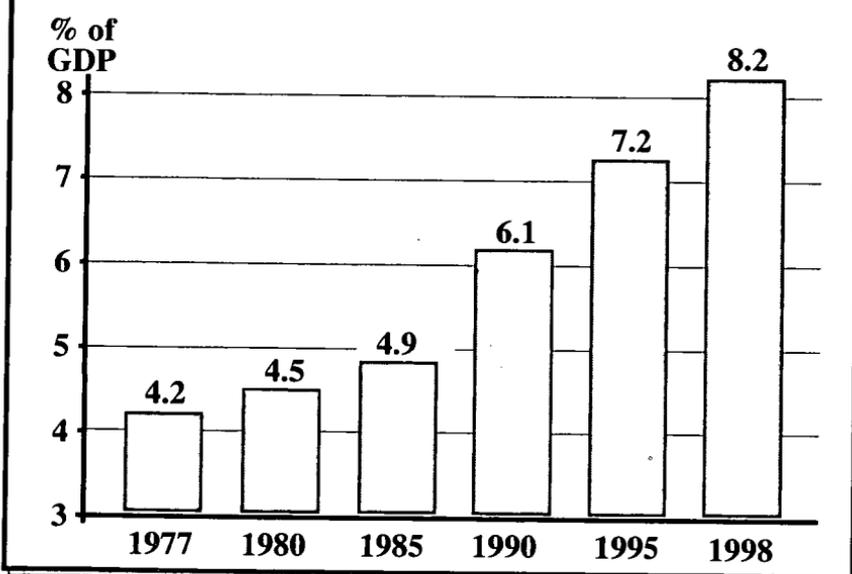
²⁸For additional evidence on the size and importance of Internet commerce in the United States, see *The Internet Economy Indicators* (Austin: University of Texas Center for Research in Electronic Commerce, 1999).

Figure 5.6: Real Investment in Producers' Durable Equipment



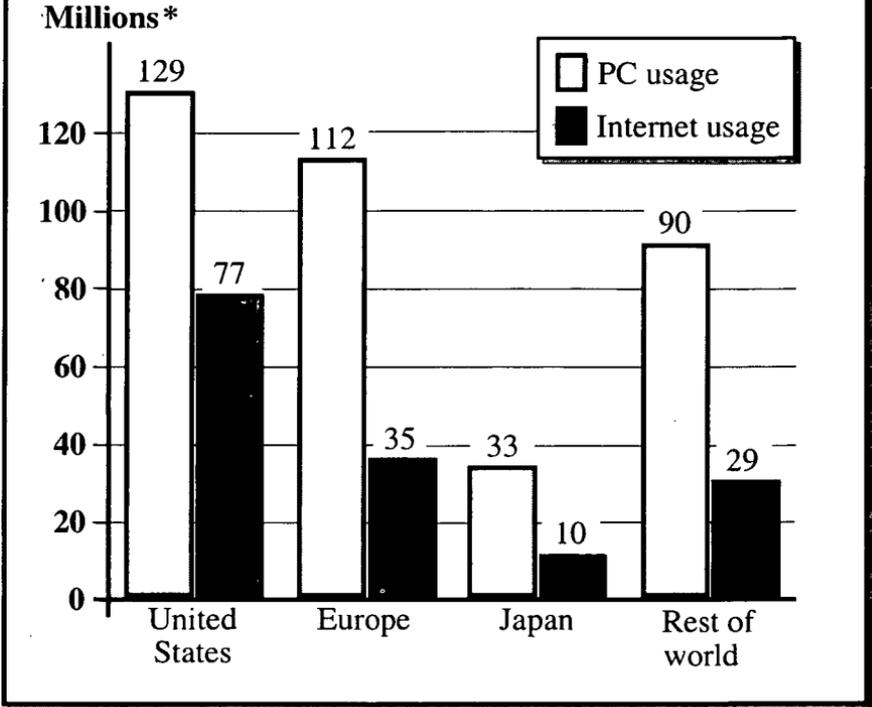
Source: Haver Analytics.

Figure 5.7: Growth of High-Technology Sector



Sources: Bureau of Economic Analysis, *Survey of Current Business*, March 1998; *Economic Report of the President*, 1999.

Figure 5.8: U.S. Leadership in Personal Computer and Internet Usage



Source: *Computer Industry Almanac*.

Note: *Millions of personal computers in use / millions of weekly Internet users.

Increasingly, we live in a world where growth is driven by brainpower and entrepreneurship. The economic structure of the U.S.—the legal structure, dynamic venture capital market, recent record of price stability, openness of the economy, and reliance on markets—provides a favorable environment for success in this new world.

Besides the growth of fixed investment and of the high-technology sector, other factors influencing growth also appear positive or at least neutral. If the Federal Reserve continues to remain vigilant, there is no reason why the relative price stability of recent years cannot be maintained. The positive effects on growth from the trade sector will also continue. While the demographic changes in the decade ahead will not be as favorable as they have been during the 1990s, they will still be quite positive. Therefore the evidence points to a robust rate of growth being sustainable at least for the next decade.

VI. The U.S. Economy Is at a Crossroads

The prospects for the U.S. economy are bright. If we continue to follow a stable monetary course and expand the openness of the economy, economic growth in the decade ahead is likely to be the most robust since the 1960s. Sustaining the recent annual growth of 3.5 percent is not only possible, it is likely. However, to achieve robust growth, we must control the size of government. Big government means slow growth, and rapid growth in government leads to economic stagnation. The recent history of the major Western European economies, Japan, and even Canada illustrate this point (see Figures 3.3 to 3.5).

Because of the favorable demographics resulting from the unusually large share of the population in their prime earning years, tax revenue will be high and, if new programs are not adopted, government spending will decline as a share of GDP in the near future. In addition, both major political parties support the use of the Social Security surplus to pay down outstanding federal debt. This will reduce future interest costs, which will also help reduce the relative size of government. Post-Cold War defense cuts facilitated reductions in the size of government as a share of the economy in the 1990s. In turn, smaller government contributed to recent economic growth. Favorable demographic trends can play the same role in the decade ahead.

However, dangers lurk beneath the favorable demographics and projected revenue growth. New spending initiatives will be tempting. It would be shortsighted to adopt them. As the baby boomers begin to retire, the impact of demographics on the budget will change dramatically. If we are not sensitive to this situation, the combination of new spending commitments and current obligations to future retirees will cause the U.S. to become a stagnating "big government" economy sometime after 2010.

The United States is at a crossroads. We can use the revenue increases accompanying the current favorable demographics to undertake new spending initiatives. If we choose this route, government spending will rise sharply when the baby boomers retire. Between 2010 and 2030, persons age 65 and over will increase from 12 percent to 18 percent of the population. Given current commitments, this change alone will increase government spending as a share of the economy by 4 to 6 percentage points. Should we undertake additional commitments, particularly to the elderly, the U.S. will be "Europeanized" when the baby boomers retire. The big-government European nations have been surpassed by others following more

sensible policies. The United States will experience the same fate if we allow our government to get too big.

The alternative is to control government spending and allow the favorable demographics of the upcoming decade to reduce the relative size of government. It would also be helpful to reform the pay-as-you-go Social Security and health care programs in a manner that encourages private saving and economizing behavior. If we choose this alternative, the future of the U.S. economy is exceedingly bright. The budget choices in the years immediately ahead will determine which route we will take.

Prepared by James Gwartney, Chief Economist to the Chairman; James Carter, Chris Edwards, Angela Ritzert, Kurt Schuler, Charles D. Skipton, Robert Stein, Lawrence Whitman, and Victor Wolski.

This staff report reflects the views of the authors only. These views do not necessarily reflect those of the Joint Economic Committee, its Chairman, Vice Chairman, or any of its Members.

The 2000 Joint Economic Report

April 2000

**Joint Economic Committee
Office of the Chairman,
Senator Connie Mack**

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THE 2000 JOINT ECONOMIC REPORT

Mr. MACK, from the Joint Economic Committee,
submitted the following

REPORT**OVERVIEW OF THE ECONOMY**

The United States continues to enjoy the effects of the Great Expansion, a period of economic growth since December 1982 that has been interrupted only by a shallow recession from August 1990 to March 1991. The U.S. economy has spent less time in recession since December 1982 than in any comparable period in history. As of March 2000, economic indicators continue to show favorable conditions. Real (inflation-adjusted) economic growth is approximately 4 percent, above average for the expansion as a whole; unemployment is around 4 percent, its lowest level since the late 1960s; and inflation remains subdued, at 2 to 3 percent a year. Healthy economic growth has contributed to continuing surpluses in the federal budget.

The international economy is improving. Most of our trading partners have better prospects for growth today than during the period of currency crises that affected many developing countries from July 1997 to January 1999. This means that demand for U.S. exports should strengthen. The only cloud in the sky is the big jump in the price of oil, which threatens to reduce economic growth worldwide. However, because of changes in the U.S. economy, we are now in a better position to weather adverse consequences than we were in the 1970s.

The current segment of the Great Expansion, since April 1991, has lasted so long in part because, unlike in most previous expansions, growth in productivity has not fallen; rather, it has accelerated in recent years. This is good news because growth in productivity is vital to long-term improvement in the standard of living. The enormous investment that American businesses and workers have made in new

technology, particularly computer technology, is bearing fruit and from all indications will continue to do so for years to come.

Unlike the expansions of the 1960s and 1970s, the Great Expansion is not the result of policies aimed at stimulating demand. In the 1960s and 1970s, policies to stimulate demand often led to inflation, provoking policy makers to depress demand to bring inflation back under control. This stop-go strategy was discarded during the early 1980s. Since then, monetary policy has focused on price stability and fiscal policy has focused on long-run growth.

Expansions do not die of old age. Sometimes they are ended by dramatic change beyond the control of policy-makers such as a natural disaster or financial crisis abroad. In other cases, they end as a result of domestic policy errors such as a monetary shock. For 20 years, the Federal Reserve has avoided sudden changes in inflation and has gradually reduced the rate of inflation to low single digits. The resulting stability has enabled Americans to plan for the near term and the long term with confidence that their efforts would not be derailed by sharp fluctuations in prices and interest rates like those of the 1970s.

Another error is to have tax rates so high that they strongly discourage productive effort. In the early 1980s the United States slashed top rates on income taxes and capital gains taxes to spur economic growth. Since then, tax rates have gradually crept up, though not to their former levels. By avoiding increases that are too large and too sudden, the federal government has generated higher tax revenues without stifling economic growth. Still, the federal government today takes about as much of the nation's income in taxes as it did during the height of World War II. It is appropriate to ask what can be done to reduce the burden of taxes so as to help prolong the current expansion.

The majority report examines the roots of the Great Expansion and makes suggestions to help it continue. Through its hearings and staff reports, the Joint Economic Committee addresses important economic issues facing the United States. Additional information is available on our Web sites (for the office of the chairman, <<http://www.jec.senate.gov>>; for the office of the vice chairman, <<http://www.house.gov/jec>>). We hope this report adds to the public's understanding of the U.S. economy.

SENATOR CONNIE MACK

Chairman

REPRESENTATIVE JIM SAXTON

Vice Chairman

INTRODUCTION

There are competing visions for the future direction of the U.S. government. One prominent vision claims we are best served by an activist government, another that we are best served by controlling and reducing the size of the federal government.

The activist vision proposes more government involvement for the problems facing our country. President Clinton's February 2000 State of the Union message, advocating more than 60 new federal spending initiatives, is an example of the activist vision. If it is followed, government spending will soon begin to rise as a share of the economy.

The limited-government vision focuses on controlling and reducing the size of government by offering people greater choice and more options for addressing the nation's problems. It stresses that the keys to economic progress are price stability, secure property rights, freedom of exchange in international markets, a small federal government and low taxes.

Which vision we follow will greatly influence how prosperous America's future will be. As the experience of Europe indicates, slow growth and stagnating living standards will result if government is too big. No country has been able to achieve and sustain high rates of economic growth when government spending has risen to 40 percent or more of the economy. (In the United States, total *spending* by all levels of government in 1999 was 28 percent of GDP, down from the plateau of 30 to 32 percent that existed for most years from 1975 to 1995. Total government *receipts* were 29.9 percent of gross domestic product [GDP], the highest level ever.¹)

In contrast, countries following policies consistent with price stability and free trade while restraining the size of government have persistently achieved solid growth. This mix of policies has been the key to the strong economic performance of the United States during the 1980s and 1990s. It has also been the prescription for the economic success of Ireland, Australia, Hong Kong, Singapore and several other countries in recent years.

¹These and some other statistics in this report reflect the recent revisions to U.S. national income statistics.

1. THE GREAT EXPANSION

In terms of economic performance, government policy, and effect on the thinking of professional economists, the 1980s and 1990s form a continuous era radically different from what preceded it.

Former Federal Reserve governor
Lawrence B. Lindsey

I. The Great Change in Policy, 1979-81

During the 1970s, the U.S. economy was plagued with inflation and economic instability. It performed poorly mainly because policy makers, influenced by incorrect economic theories, sought to achieve goals beyond their means. At the time, many economists and policy makers believed government could smooth business cycles by “fine-tuning” fiscal and monetary policy. The result was ill-conceived policies that caused stop-go cycles of economic growth. Many economists and policy makers also believed government could stimulate economic demand to reduce unemployment. The result was double-digit inflation.

Chastened by the combination of high unemployment and double-digit inflation that conventional economic models claimed should not occur, policy makers began to change their goals. In October 1979, President Jimmy Carter appointed Paul Volcker chairman of the Board of Governors of the Federal Reserve System. The emphasis of monetary policy shifted toward constraining inflation and achieving price stability. In 1981, newly elected President Ronald Reagan refocused fiscal policy on the long run. He proposed, and Congress passed, sharp cuts in marginal tax rates. The cuts increased incentives to work and stimulated growth. These were fundamental policy changes that provided the foundation for the Great Expansion that began in December 1982.

As Exhibit 1 shows, the economic record of the last 17 years is remarkable, particularly when viewed against the backdrop of the 1970s. The United States has experienced two of the longest and strongest expansions in our history back-to-back. They have been interrupted only by a shallow eight-month downturn in 1990-91. The years from 1983 are best viewed as a single expansion, with its roots in the policy changes of the late 1970s and early 1980s. There has never

Exhibit 1: The Great Expansion, 1983-Present

Both segments of the Great Expansion have delivered growth in consumption, production, jobs, and stock market valuation.

	1983-90*	1991-99*	Entire period
<u>Real GDP</u>			
Total growth	35.7%	33.0%	80.9%
Average annual growth	4.1%	3.3%	3.6%
<u>Real GDP per person</u>			
Total growth	26.7%	22.4%	54.2%
Average annual growth	3.2%	2.3%	2.6%
<u>Real consumption per person</u>			
Total growth	26.8%	24.1%	56.9%
Average annual growth	3.2%	2.5%	2.7%
<u>Industrial production</u>			
Total growth	28.9%	38.7%	78.9%
<u>Employment</u>			
Total growth	19.9 mil.	16.4 mil.	35.0 mil.
<u>Dow Jones Industrial Average</u>			
Average annual growth	14.5%	16.1%	15.0%

Sources: Industrial production data are annual figures from *Economic Report of the President, 2000*. DJIA data are quarterly averages from Economagic.com. Changes in real GDP and consumption are based on figures for 4-quarter moving averages, derived from data extracted from Haver Analytics.

Note: *The 1983-90 expansion is measured from 1983:q1 - 1990:q2. The 1991-99 expansion is measured from 1991:q2 - 1999:q4.

been a period of comparable length with so much growth and so little contraction in the history of the United States.²

During the last 17 years:

- Real GDP expanded 81 percent (3.6 percent a year).
- Real GDP per person rose 54.2 percent; real consumption per person rose 56.9 percent.
- Employers created more than 35 million new jobs.
- Industrial production jumped 78.9 percent.
- The Dow Jones Industrial Average ballooned 11-fold (15 percent a year).

II. Factors Underlying the Great Expansion

Economic growth is no accident: it is influenced by the policies and organization of an economy. Countries must establish an appropriate economic environment if they want to achieve and sustain rapid growth.³ The key elements of this environment are monetary stability, secure property rights, a legal structure that enforces contracts, free trade, limited government, and low taxes. The Great Expansion has occurred within this framework.

Price stability. Price stability enhances the efficiency of an economy. Low and steady rates of inflation reduce uncertainty in making long-term decisions, such as buying a house or business machinery. When inflation is low, people can spend more time producing and less time trying to protect themselves from inflation. In addition, low inflation avoids imposing the extra tax that in effect falls on earnings if taxes are not indexed for inflation.

Under the chairmanships of Paul Volcker and Alan Greenspan, the Federal Reserve has successfully focused on price stability. As Exhibit 2 shows, the year-to-year change in the rate of inflation has never exceeded 1.2 percentage points since 1983. Low inflation during the 1980s contributed to the strength of that decade's expansion. With the passage of time, confidence increased that the Federal Reserve would

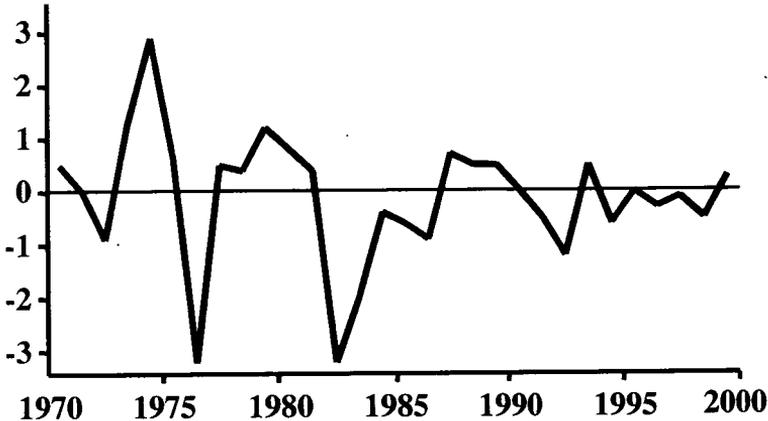
²To put the period in perspective, consider that the U.S. economy was in recession approximately 33 percent of the time from 1910 to 1959 and 23 percent of the time from 1960 to 1982, but only 4 percent of the time since 1982. This is by far the lowest percentage of any comparable period in American history.

³See Joint Economic Committee, Office of the Chairman, "Economic Growth and the Future Prospects of the U.S. Economy," October 1999, available online at <<http://www.senate.gov/~jec/gp1.htm>>.

Exhibit 2: Inflation Volatility

Inflation has been far less variable during the Great Expansion than it was in the 1970s.

**Year-to-year
change**
(percentage points)



Source: *Economic Report of the President*, 2000, table B-3.

Note: Based on implicit GDP price deflator.

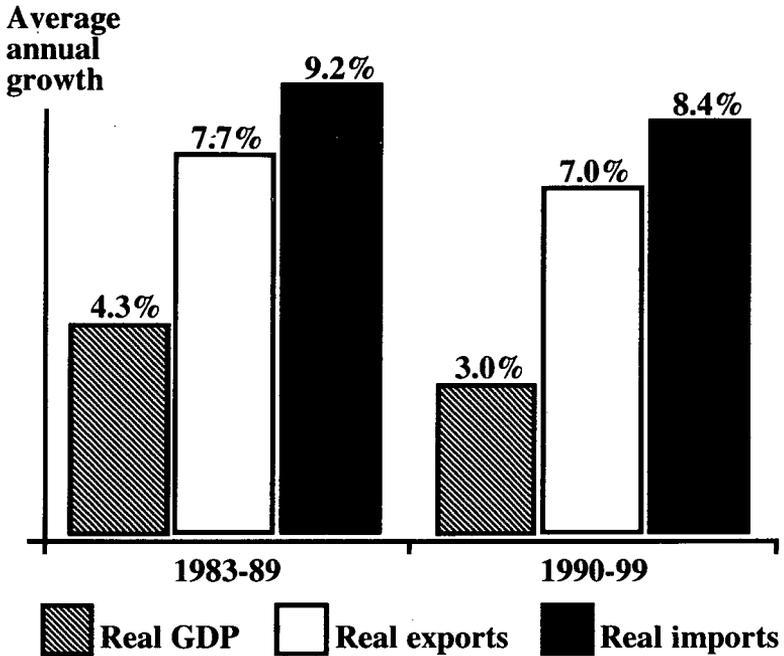
continue striving for price stability, contributing substantially to the growth of the economy during the 1990s.

When the monetary authorities achieve price stability, they have done their part to enhance growth and prosperity. In this regard, the performance of the Federal Reserve during the last two decades has been outstanding.

Increases in the size of the trade sector. Both parties in a trade gain. Buyers, whether consumers or businesses, gain because trade enables them to buy things more cheaply. Sellers gain because trade enables them to sell more goods at better prices. Each party to a trade can focus more on producing those things it does most efficiently. Together, trading partners produce more and achieve higher standards of living than they could do separately. Trade also increases the competitiveness of markets and generates additional gains from economies of scale, the introduction of new products, innovative

Exhibit 3: Growth of Trade

During the Great Expansion, international trade has grown faster than GDP, helping to propel economic growth.



Source: *Economic Report of the President*, 2000, table B-2.

methods of production, and the spread of technology. All this enhances efficiency and promotes growth.⁴

Trade liberalization and reductions in the cost of transportation and communications have helped boost U.S. and international trade during the last 15 years. Some countries have reduced their trade barriers unilaterally, while others have done so as an outgrowth of the “Uruguay round” negotiated by the United States and other members of the General Agreement on Tariffs and Trade (GATT). The United States has particularly reduced trade barriers with Canada and Mexico, concluding the U.S.-Canadian Free Trade Agreement in 1988 and the North American Free Trade Agreement (NAFTA) in 1994.

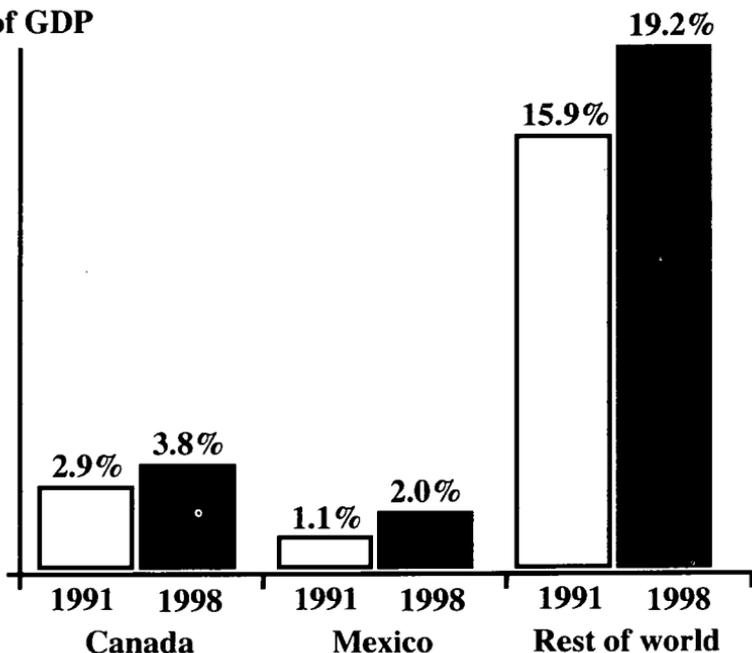
During the Great Expansion, the size of the U.S. trade sector has increased dramatically. Adjusted for inflation, exports more than

⁴For more on the impact of trade on the economy, see Joint Economic Committee, Office of the Chairman, “12 Myths of International Trade,” July 1999, available online at <<http://www.senate.gov/~jec/trade1.html>>.

Exhibit 4: U.S. Trade with Canada, Mexico, and the Rest of the World

U.S. trade with Canada and Mexico has grown rapidly under NAFTA. So has trade with the rest of the world.

Trade as
a Share
of GDP



Sources: *Economic Report of the President*, 2000, table B-1; Department of Commerce, International Trade Administration Web site, <http://www.ita.doc.gov>.

Note: Trade share represents (imports + exports) / GDP.

tripled from 1983 to 1999; imports expanded even more rapidly. As Exhibit 3 shows, imports and exports alike rose roughly twice as fast as GDP in the 1980s and the 1990s. Exhibit 4 illustrates the growth of U.S. trade in goods and services with Canada, Mexico, and other countries. From 1991 to 1998, trade with Canada rose from 2.9 percent to 3.8 percent of U.S. GDP, while trade with Mexico jumped from 1.1 percent to 2.0 percent. U.S. trade with other countries also expanded, indicating that NAFTA not only expanded U.S. trade with Canada and Mexico but contributed to an expansion in the overall size of the trade sector.

Economists of almost all persuasions accept that economies open to trade produce more value from their resources and achieve higher levels of income than closed economies.⁵ In contrast, protectionists argue that increased openness and expansion in trade creates unemployment, capital flight to low-wage economies, and economic stagnation. The facts support the free trade position. As the U.S. economy has become more open, employment has increased by 35 million and the rate of unemployment has fallen to its lowest level in 30 years. From 1983 to 1998, foreigners invested \$1.5 trillion more in the United States than Americans invested abroad. From 1983 to 1999, real GDP per person in the United States rose from \$21,102 to \$32,439, an increase of 54 percent. Both Congress and the Clinton Administration have generally supported open markets and rejected protectionist calls for trade restraints. Their actions have contributed to the growth and strength of the U.S. economy.

Lower marginal tax rates. When Ronald Reagan became president in 1981, the top marginal rate on federal income taxes stood at 70 percent. At Reagan's urging, Congress cut rates across the board by about 30 percent and indexed taxes for inflation. In 1986, it cut marginal tax rates again and the top rate fell to 28 percent. In just a few years, after-tax returns for the top earners jumped from 30 cents to 72 cents per dollar of additional earnings, a 140 percent increase in the incentive to earn. The effects of lower tax rates were smaller but still substantial in other brackets. Although Congress raised marginal rates in the early 1990s, marginal rates in almost all tax brackets are still well below the levels of the 1970s.⁶ These lower rates continue to enhance the growth of the U.S. economy.

⁵The positive impact of trade on growth is also stressed by the *Economic Report of the President 2000*, which states:

The freedom of firms to choose from a wider range of inputs, and of consumers to choose from a wider range of products, improves efficiency, promotes innovation in technology and management, encourages the transfer of technology, and otherwise enhances productivity growth. These benefits in turn lead to higher real incomes and wages. (*Economic Report of the President Transmitted to the Congress February 2000*, Washington: Government Printing Office, 2000, p. 282).

⁶For a detailed analysis of how reductions in marginal tax rates during the 1980s helped strengthen the U.S. economy, see Joint Economic Committee, Office of the Chairman, "The Supply-Side Revolution: 20 Years Later," March 2000, available online at <<http://www.senate.gov/~jec/ssreport1.htm>>. Some claim the Reagan tax cuts were a mistake. But to return to the steeply progressive rate structure that Reagan inherited, with a confiscatory top rate of 70 percent and no adjustments for inflation, would be a severe blow to the American economy. According to estimates by the Joint Committee on

Reductions in the size of government. Governments contribute to economic growth when they provide an environment conducive to peaceful interaction among citizens and the smooth operation of markets. As we discussed in a prior report,⁷ the following factors are particularly important:

- National defense and police services that protect people and property from aggression.
- Monetary arrangements that provide citizens with access to sound money.
- A legal system that enforces contracts and provides a forum for settling disputes.
- Provision of a limited set of goods that are difficult to provide through markets.

When governments handle these core activities well, they enhance economic growth. However, if they move beyond these functions and become producers of goods and redistributors of income, they generally do more harm than good. Economies with high government spending usually have sluggish economic growth. For example, in the last four decades, among countries that belong to the Organisation for Economic Co-operation and Development (OECD), a 10-percentage point increase in government spending has been associated with a 1 percent reduction in the long-term rate of annual economic growth.⁸

Federal government spending in the United States persistently rose as a share of GDP between the mid-1960s and the early 1980s. After leveling off during the 1980s, the relative size of government declined during the 1990s. Federal spending has fallen approximately 4 percentage points as a share of GDP in the last seven years. The relationship mentioned in the previous paragraph suggests that the shrinkage of government during the 1990s enhanced growth by

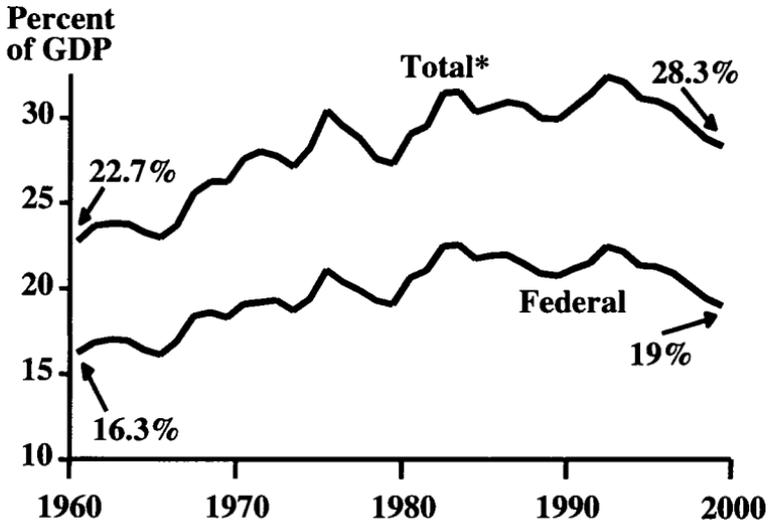
Taxation of the U.S. Congress, under static analysis this would increase the tax burden by \$871 billion in 2000 alone, nearly doubling individual income taxes and raising overall taxes 54.7 percent. A middle-class family earning \$30,000 would see its taxes increase 45 percent. Because of the economic distortions resulting from such an increase, actual revenue collected would be less than this amount, perhaps even less than under current law.

⁷Joint Economic Committee, "Economic Growth and the Future Prospects of the U.S. Economy," pp. 22-7.

⁸James Gwartney, Robert Lawson, and Randall Holcombe, "The Size and Functions of Government and Economic Growth," Joint Economic Committee, April 1998; the full text is available online at <<http://www.house.gov/jec/growth/function/function.htm>>.

Exhibit 5: Government Spending as a Share of GDP

Measured as a share of GDP, government spending rose during the 1960s and 1970s, leveled off during the 1980s, and fell during the 1990s.



Source: *Economic Report of the President*, 2000, table B-80.

Note: *Total government spending includes federal, state, and local.

approximately one-tenth this amount, or 0.4 percent a year. The decline in government spending as a share of GDP is shown in Exhibit 5.

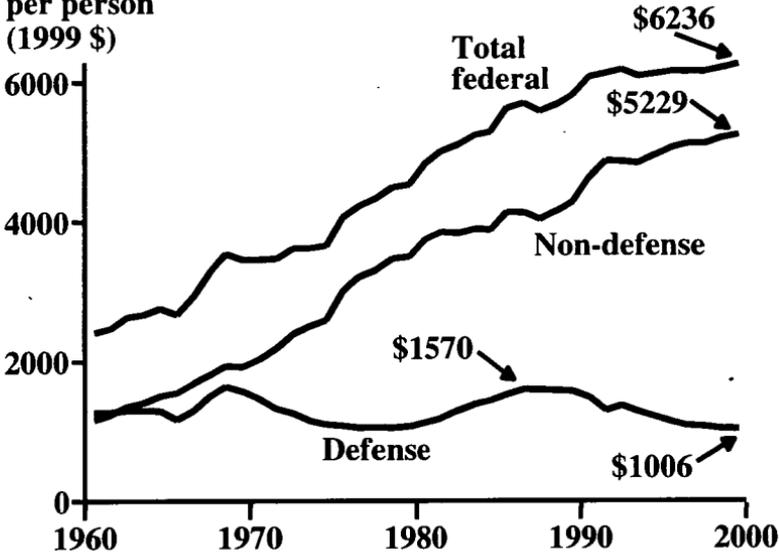
Exhibit 6 presents data on real federal spending per person, measured in 1999 dollars. This figure rose from \$2,379 in 1960 to \$6,169 in 1992. Real spending per person on programs other than defense more than quadrupled, from \$1,137 in 1960 to \$4,837 in 1992. During the 1990s, the growth of real federal spending per person slowed substantially, mainly as a result of lower defense spending. From 1992 to 1999, total real federal spending per person was nearly unchanged, rising from \$6,169 to \$6,236, an increase of \$67. During the same period, defense spending fell \$326 per person. Both changes reflect the priorities of the Clinton Administration, which has been keener to cut defense spending and less interested in restraining non-defense spending than the Republican Congress.

Demographics. The changing demographics of the workforce have been an overlooked factor facilitating faster economic growth in the Great Expansion. Most people spend their twenties and early

Exhibit 6: Real Federal Spending per Person

Non-defense spending has driven the growth of the federal government. Defense reductions after the Cold War victory have slowed real federal spending per person in the 1990s.

**Federal spending
per person
(1999 \$)**



Sources: *Economic Report of the President, 2000*, tables B-1, B-3, B-82; population data from Haver Analytics.

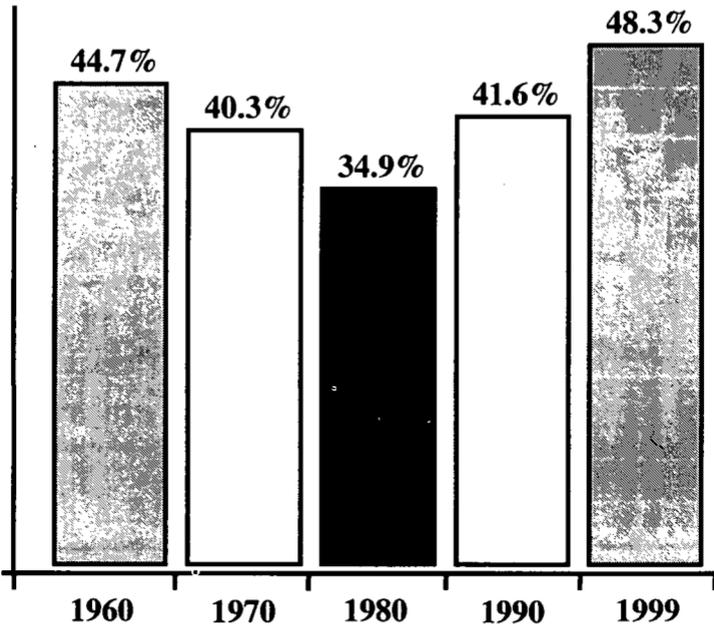
Note: Federal spending data are for fiscal years. For underlying data, see Appendix, table 1.

thirties developing skills through higher education, training, and job experience. During these years, their productivity and earnings are below average. At the other end of their careers, as they approach retirement their productivity often declines because their health declines and because their job skills may not be as up-to-date as before. Thus, the productivity and earnings of people in their late fifties and over are also below average. People 35 to 54 generally have the combination of education, experience, and health that results in the highest levels of productivity. Therefore, an increase in the share of the population 35 to 54 years old tends to push average productivity and earnings upward.

Exhibit 7: Prime-Age Earners as a Share of the Labor Force

Prime-age earners (35-54) fell as a share of the labor force during the 1960s and 1970s but rose during the 1980s and 1990s, enhancing growth during the Great Expansion.

Share of
labor force



Source: Haver Analytics.

Note: For underlying data, see Appendix, table 2.

In the 1980s, the “baby boom” generation began moving into their prime earning years. The share of the labor force in the prime years rose sharply during the 1990s. We estimate that the expansion in prime-age workers increased the total productivity of the labor force by about 0.5 percent a year from 1991 to 1998. Since World War II, labor productivity has grown an average of about 2 percent a year, so an increase of 0.5 percent is substantial. The changing share of the labor force made up by prime-age workers is shown in Exhibit 7.

High technology. The high-technology sector has played a starring role in the dynamic economic climate of the 1980s and 1990s. High-tech industries now account for over 8 percent of U.S. GDP, up from 4.5 percent in 1980. U.S. software, semiconductor, biotechnology,

pharmaceutical, and Internet-related companies dominate world markets.

Coincident with the rapid growth in high-tech industries has been an explosion of entrepreneurship. Entrepreneurs have created thousands of fast-growing technology firms such as America Online, Cisco Systems, Compaq Computer, Dell Computer, and Microsoft, which were nonexistent two decades ago. While many pundits believed that "strategic" federal action was needed to shore up America's high-tech sector a decade ago, it is now clear that it was the energetic and forward-looking actions of many individual entrepreneurs that put the U.S. economy back on top.

Technology has given new entrepreneurial businesses the tools needed to compete against the largest corporations. The growth in personal computers, sophisticated software applications, and the Internet has allowed new businesses to shake up many formerly stable industries. To respond to the new competitive realities, big businesses have invested billions in information technology equipment. Real business equipment and software investment have grown over 11 percent a year since 1991.

At the same time, revolutions in the nation's capital markets, spurred by financial deregulation and technology, have channeled huge investment flows to new, entrepreneurial businesses. High-yield debt securities provided needed capital to fast-growing businesses and helped fund the corporate restructuring boom during the past two decades. Big corporations were forced to become more entrepreneurial to respond to intensified competition at home and in foreign markets.

Deregulation and capital gains tax cuts helped the venture capital market take off in the early 1980s. Venture capital investment in fast-growing companies in Silicon Valley and other hot spots has exploded from \$3 billion in 1990 to \$48 billion in 1999. Venture capital is flowing into new companies in fast-growing industries such as computers, telecommunications, and biotechnology. Complementing the growth in venture capital is the great success of the NASDAQ stock market, which has allowed thousands of young technology companies access to the funds they need to grow and compete. The NASDAQ now hosts hundreds of initial public offerings each year. The value of initial public offerings rose from \$2 billion in 1990 to \$50 billion in 1999.

The success of the U.S. high-tech sector illustrates the mutually reinforcing strengths of entrepreneurship and dynamic capital markets. Entrepreneurs have flooded into competitive high-tech industries because of the huge opportunities and rewards available to successful innovators. America's diverse sources of financial and human capital

have ensured that good ideas are not overlooked, and that many paths to innovation and economic growth are pursued.

Welfare reform. The federal government enacted sweeping welfare reforms in 1996. It ended the “entitlement” status of welfare, whereby anyone with children who had a sufficiently low income automatically qualified for federal benefits. States were given much greater latitude in setting eligibility requirements and time limits for those receiving benefits. Since then, the share of the U.S. population on welfare has fallen dramatically--substantially more than can be attributed to the general strength of the economy.

Before welfare reform, the unemployment rate had been hovering around 5.5 percent for about 18 months. This was a higher rate than near the end of the 1983-90 expansion. Not until welfare reform was enacted did the unemployment rate drop below the low of the previous expansion toward the 30-year low we enjoy today.

For the economy as a whole, the cost of hiring workers includes not only compensation directly paid to workers and the taxes on their earnings, but transfer payments to potential workers who are not working. By making work less attractive for those entering the labor force in low-paying jobs, transfer payments to the able-bodied unemployed tend to increase the unemployment rate. By reducing transfer payments to the able-bodied unemployed, welfare reform reduces the cost of hiring, thereby increasing employment in the private sector and stimulating economic growth. Once in the labor force, workers in low-paying jobs acquire skills that help them stay employed and move into higher-paying jobs, whereas if they had remained unemployed they never would have acquired the skills.

III. Why Has the Budget Shifted from Deficit to Surplus?

From 1987-89, the federal budget deficit was approximately \$150 billion each fiscal year. The deficit rose during the contraction of 1990-91 and fell as the economy began to recover. The Clinton Administration claims that its 1993 tax increase reduced the budget deficit and led to lower interest rates that propelled the expansion of the 1990s.⁹ The facts are inconsistent with this view. Interest rates, which had fallen steadily throughout 1992 and the first half of 1993, began rising almost immediately following the Clinton tax increase and passage of the 1993 budget. By July of 1994, the interest rate on 30-

⁹In 1999, for example, President Clinton stated, “Our new economic strategy was rooted first and foremost in fiscal discipline....The market responded by lowering long-term interest rates.” *Economic Report of the President Transmitted to the Congress February 1999* (Washington: Government Printing Office, 1999), p. 3.

year Treasury bonds had risen to 7.6 percent, up from 5.9 percent in October of 1993. Other rates followed a similar path. President Clinton's scenario that his 1993 tax and budgetary policies lowered interest rates and unleashed the current expansion is simply mythology.¹⁰

If the Clinton tax and budgetary policy had little to do with the transformation of the federal budget, what accounts for the turn around? Aside from the cyclical effects of the expansion, a variety of other factors caused the federal budget to turn from deficits to projections of large and growing surpluses.

Higher defense spending in the 1980s enabled spending to be lower in the 1990s. Higher real defense spending in the 1980s proved to be an excellent investment. It led to victory in the Cold War. Following the collapse of the Soviet Union, however, real defense spending declined as the American people asked for a "peace dividend." As the Clinton Administration often highlights, the unemployment rate remained high in 1991 and 1992, the last years of President George Bush's administration, even though the economy was expanding. The transitional movement of resources out of defense and into non-defense industries was a major factor underlying the unusually high unemployment of the period. The United States was able to shift more than 2 million jobs out of defense-related industries between 1989 and 1993. In the short run, this was a major contraction of an important sector, resulting in sluggish growth and upward pressure on the unemployment rate. However, our free market economy created new jobs to use the talents of the displaced defense workers. This exerted a positive impact on the long-run health of the economy.

Favorable demographics. During the 1990s, prime-age workers grew rapidly as a share of the work force, while the elderly population grew much more slowly. The rapid growth of the prime-age workers propelled federal revenues, while the slow growth of the elderly population restrained spending.

Flow of funds into and out of tax-favored savings accounts. Tax legislation during the 1980s encouraged individuals and families to channel funds into tax-free Individual Retirement Accounts (IRAs) and 401(k) accounts. As funds flowed into these accounts in the 1980s, federal revenues were reduced. Funds began to flow out of these accounts in the late 1990s because federal law requires people to start withdrawing from them by age 70-1/2 or face penalties. The

¹⁰For additional details on this topic, see Joint Economic Committee, Office of the Vice Chairman, "Assessing the Current Expansion," January 2000, available online at <<http://www.house.gov/jec/growth/assess/assess.pdf>>.

withdrawals are taxable. In early 1999, the Congressional Budget Office estimated that withdrawals from taxable IRAs would rise from \$93 billion in 1999 to \$195 billion by 2008. Currently, 401(k) assets are about 60 percent as large as IRA assets, indicating that withdrawals from them will also generate significant tax revenue in the coming years.

IV. Can the Great Expansion Continue?

When analyzing the factors underlying the Great Expansion, one thing is clear: a major paradigm shift occurred between the 1970s and 1980s. In the 1970s, economists and policy makers alike believed that inflationary policies would reduce unemployment. The policy makers of the 1980s rejected this view and redirected economic policy toward price stability and long-term goals regarding taxation and spending. In the 1970s, it was widely believed that stop-go monetary and fiscal policy could smooth the ups and downs of the business cycle. Only the demand-side effects of fiscal policy were recognized; the supply-side incentive effects were ignored until the 1980s. These were fundamental changes in economic thought that shifted economic policy toward an environment more conducive to economic growth.

Can the Great Expansion continue? It is unlikely that the business cycle has been repealed. Surprise shocks will no doubt occur in the future and they will exert a destabilizing influence on the economy. In this regard, the recent dramatic rise in the price of crude oil is a source of concern. When oil prices rise, oil-importing nations like the U.S. have to give up more of other things for each barrel of oil imported. This adversely affects their potential output and short-term growth. Energy consumption, however, is now a smaller portion of the U.S. economy than was true two decades ago. In 1981, energy expenditures comprised 14 percent of GDP; today the comparable figure is 7 percent. Petroleum expenditures were over 8 percent of GDP in 1980; today they are just 3 percent. Sustained high oil prices may cause the U.S. economy to slow, but given its current strength, they are unlikely to throw it into a recession.

The most important lesson of the Great Expansion is a positive one: monetary and price stability, free trade, small government, and low taxes provide the prescription for stability and prosperity. The Federal Reserve has kept its focus on achieving price stability during the Great Expansion. This should continue to be its focus in the future. Lower trade barriers will enhance the growth of an economy for years to come. The U.S. economy can expect to reap gains from NAFTA for at least another decade, and additional gains can be achieved from further reducing trade barriers. Favorable demographics--the large

share of the work force in the prime-age category--will continue for another decade. However, around 2010 the demographic trend will become less favorable. This will not only slow growth; it will also tend to expand the size of government unless Social Security and Medicare are reformed.

The lesson of the last two decades is clear: a continuation of the strong and steady growth experienced during the last 18 years is achievable if we follow sound policies. Now we turn to the steps that need to be taken to provide prosperity for the next generation of Americans.

2. IMPROVING SOCIAL SECURITY, HEALTH CARE, AND EDUCATION

Social Security, health care, and education now account for more than half of combined federal, state, and local government spending. As Exhibit 8 shows, spending in these three areas rose from 10.8 percent of GDP in 1970 to 15.5 percent in 1996. Despite the increase in spending, all three areas continue to suffer from poor performance. In each case, the problem is the same: too much uniformity and too little personal choice. Central planning and regulation have replaced personal choice and market competition. As the experience of centrally planned economies illustrates, a “one size fits all” approach is ultimately a recipe for disaster. Good intentions are no substitute for sound policies. The problems of Social Security, health care, and education are structural, and will not be solved by spending more money in the same old way.

I. Social Security

The pay-as-you-go Social Security system was initiated in 1935 in favorable demographic circumstances. The population was growing rapidly, life expectancy past the retirement age of 65 was low, and the number of workers per retiree was consequently high in the system’s early years (16 workers per retiree in 1950). The system was designed for this environment and for many years it was adequate. Today the world is vastly different. The population is growing more slowly, people live longer, and there are only 3.4 workers per retiree. By 2034, the aging of the baby boom generation will reduce the ratio to two workers per retiree.

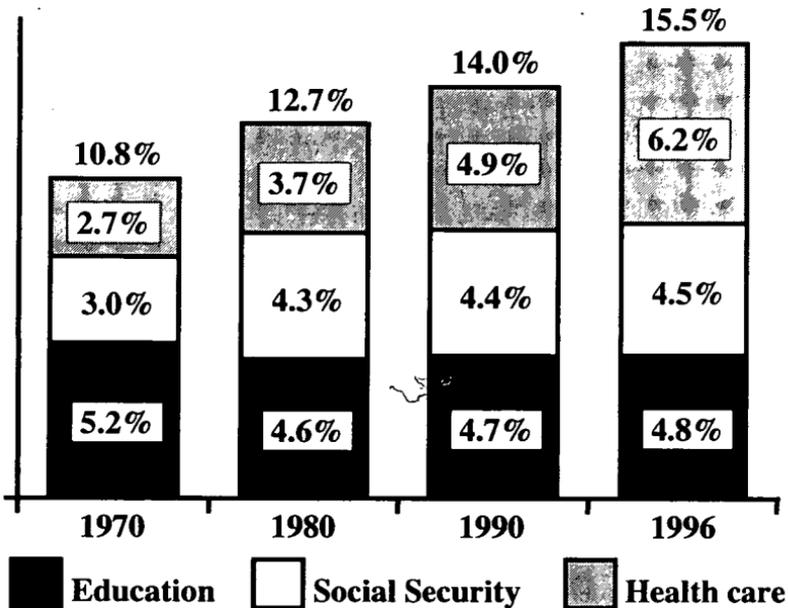
The retirement of the baby boom generation will make the Social Security system unsustainable in its present form. According to projections by the system’s trustees, by 2037 the trust fund will be exhausted and the current payroll tax rate will be unable to fund promised retirement benefits. Under reasonable population projections, promised benefits will exceed projected revenues by \$5 trillion to \$11 trillion. The retirement payroll tax already absorbs 10.4 percent of the take-home pay of each worker. Without reform, an even higher rate will be required to keep Social Security solvent.

Life expectancy is difficult to predict. During the last century, the life expectancy of Americans has increased from 47 to 77 years, or approximately 65 percent. As we move into the 21st century, developments in drugs and biogenetics may greatly increase the number of Americans over age 70 and substantially improve their

Exhibit 8: Spending on Major Domestic Programs as a Share of GDP

Federal, state, and local spending on education, Social Security, and health care is now 15.5% of GDP -- more than half of all government spending. Since 1970, spending on Social Security and health care has risen sharply.

Share
of GDP



Sources: *Digest of Education Statistics*, various issues; *Budget of the United States Government, FY 2001, Historical Tables*; Health Care Financing Administration Web site, <http://www.hcfa.gov>.

Note: Due to rounding, column totals may not equal the sum of their represented parts.

health. Like the retirement of the baby boomers, this will erode the solvency of the current Social Security system.

Under the current system, the link between taxes paid and benefits received is weak. This undermines the property rights of workers to their earnings and reduces their incentive to earn. It also results in complex redistributive effects, many of which are unintended.

The Lottery-Like Nature of the System

Social Security has become a complex redistribution program that treats several groups unfairly. Reflecting the labor force participation at the time the program was initiated, individuals can draw benefits based

on their own earnings or 50 percent of their spouse's earnings, whichever is greater. For many women, benefits based on their husband's earnings exceed benefits based on their own earnings, so many working women derive little or no additional benefits from the Social Security taxes they pay.

Although the system is financed with a flat tax, benefits are highly skewed toward those with lower incomes. Retirement benefits are set at 90 percent of the first \$6,372 per year of base earnings, but additional benefits fall to only 32 percent of earnings between \$6,372 and \$38,424 and just 15 percent of earnings above \$38,424. Thus, those with earnings above \$38,424 a year gain very little from the additional taxes they pay into the system. On its face, this appears to favor the poor. Before jumping to this conclusion, however, it is important to consider that people who earn more generally live longer. High-income beneficiaries generally draw benefits longer than low-income beneficiaries. People with low incomes are more likely to pay taxes for years and then die before collecting a penny in benefits. They may pay tens of thousands of dollars to Social Security that benefit neither themselves nor their heirs. Taking this into consideration, Social Security may actually increase economic inequality.

Differences in life expectancy also redistribute income across ethnic groups. For example, the life expectancy of blacks is lower than that of whites, so blacks are more likely to pay Social Security taxes for years and draw few or no retirement benefits. As a result, the Social Security system tends to redistribute income from blacks to whites. This is not the intent of the system, but it is a consequence of its current structure.¹¹

The current system is highly unfair to those with diabetes, heart disease, AIDS, and other life-shortening diseases. On top of the burden imposed by their health condition, Social Security forces them to hand over approximately 10 percent of their earnings even though they have little or no hope of ever deriving retirement benefits.

The design of the system is also biased against families with children. Consider two families with the same income, one with four children and the other with none. Both families will one day depend on the children to generate Social Security taxes to pay for their retirement benefits. Viewed across generations, Social Security transfers income from those with children to those without. Again, this is not necessarily the intent of the system, but it is a consequence of its current structure.

¹¹See Gareth Davis, "Ethnic and Racial Differentials in the Return from Social Security Old Age and Survivors' Insurance," unpublished paper, Heritage Foundation Center for Data Analysis and George Mason University, presented at Western Economic Association meetings, San Diego, July 8, 1999.

The bottom line is this: the current Social Security system redistributes income in complex, opaque ways. Much of the redistribution is unintended and would be considered perverse if more people were aware of it. The complexity of the system makes it difficult for policy makers and citizens to figure out what is going on. Furthermore, the lottery-like nature of the program weakens the property rights of workers over their own earnings and thereby reduces their incentive to earn.

The Savings-Investment Approach to Retirement

Given the nature of the Social Security system and the difficulties that are sure to arise with the retirement of the baby boomers, this is an excellent time to consider modifications appropriate for the environment of the 21st century. Meaningful reform of the system involves shifting from a pay-as-you-go arrangement to a savings-investment approach. Under a savings-investment approach, each generation of retirees would fund its own retirement benefits through savings during its working years.

There are several advantages of a retirement system financed by personal savings rather than taxes. First, a savings-investment system will lead to higher capital formation. Under a savings-investment system, current savings finance real assets that will generate income in the future for retirement benefits. In contrast, there is no additional capital formation under a pay-as-you-go system. Only the promise to levy the required future taxes underlies the benefits promised to workers. Because of the additional capital formation accompanying a savings-investment system, the productivity of workers will grow faster, producing higher economic growth than would occur with a pay-as-you-go system.

Second, the incentive effects of a retirement system financed by personal savings accounts (PSAs) differ sharply from those of a tax-financed system. Taxes reduce the take-home pay of workers and reduce their incentive to earn. In contrast, PSAs provide workers with property rights to the funds paid into their accounts. Additional payments into PSAs result in higher retirement benefits or, in the case of death before retirement, larger bequests to heirs. There is a direct link between payment into the system and the benefits derived from it. The disincentive effects of the current system would be removed.

Third, PSAs would give retirees more independence by giving them clearly defined rights to the assets producing their income. Payments by Social Security are not a right; they can be reduced from their promised levels, and there is a strong possibility they will be in future decades, when according to projections the Social Security system will run large deficits.

A wide range of proposals for PSAs has been introduced in Congress, by Democrats and Republicans alike. Generally, these plans would allow individuals to channel a portion of their payroll taxes into PSAs in exchange for accepting lower Social Security retirement benefits. The PSA funds would be invested and eventually used to provide annuities during retirement. Most proposed PSA plans would be voluntary, but some would be mandatory for young workers or those initially entering the work force. In some cases, the PSA funds would be administered centrally, as in the Thrift Savings Plan to which federal employees belong. In other cases, the proposals would contract out the management of funds to private investment firms. Most proposals would provide individuals with some choice over allocating funds between stocks and bonds.¹²

The Transition to Personal Savings Accounts

Moving to a system based on PSAs would solve the primary problems of the current system. However, many people are worried about the transition from a pay-as-you-go system to a savings-investment system. Some argue that the current generation of workers would pay twice: once for the benefits of current retirees and again for their own retirement benefits.

If action is taken quickly, this potential problem can be overcome. During the next decade, the Social Security system will need only about 80 percent of its projected revenues to fund the benefits of current retirees. The remaining 20 percent will be available to fund PSAs without having to raise the payroll tax. Moreover, the average real rate of return on private investment has been substantially greater than the 2 percent that future retirees can expect from Social Security. For example, the U.S. stock market has yielded an average long-run real return of 7 percent, and the long-run real return of a portfolio comprised 60 percent of bonds and 40 percent of stocks has averaged approximately 5.5 percent a year. Because of the substantially higher real return that can be expected from private investment compared to Social Security, only a portion of the current retirement payroll tax will be required to fund retirement benefits equal to those of Social Security.

Benefits promised under the current system can be maintained while still allowing current workers the option to channel 60 or 70

¹²For a summary of current reform proposals that would establish personal savings accounts, see "Personal Account Options for Social Security Reform: A Side-by-Side Comparison," Joint Economic Committee, Office of the Chairman, January 2000; the full text is available online at <<http://www.senate.gov/~jec/ss22000.htm>>. The Joint Economic Committee will publish a further report on reforming Social Security later this year.

percent of their payroll tax into PSAs. In turn, contributions of 6 or 7 percentage points of earnings to PSAs can be expected to produce retirement benefits higher than those of Social Security. In contrast, if the current system is not reformed, the retirement payroll tax will have to increase from the current 10.4 percent to approximately 15 percent to fund promised benefits to the baby boom and subsequent generations.

Compared to the current pay-as-you-go system, the savings-investment approach will increase the rate of capital formation and largely eliminate the disincentive effects of the payroll tax. It will place the United States at a competitive advantage in international markets. All of these factors will enhance economic growth and the future prosperity of Americans.

II. Health Care

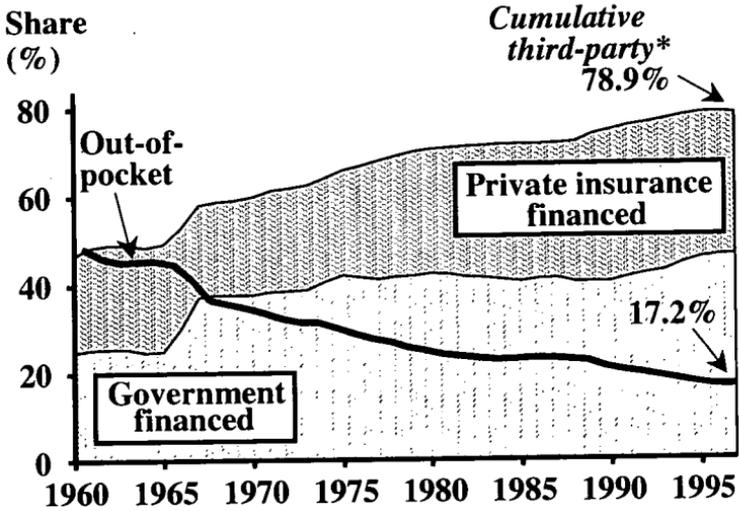
The Rising Cost of Health Care

There is considerable dissatisfaction with the cost of health care in the United States. Total spending on health care rose from 5.7 percent of GDP in 1966 to 13.3 percent in 1998. *Government* spending on health care soared from 1.7 percent of GDP in 1966 to 6.2 percent in 1998. The worst is yet to come: there will be a huge increase in the cost of Medicare, the largest government health care program, when the baby boomers retire. Like Social Security, Medicare transfers wealth from workers to retirees. The funds derived from the 2.9 percent payroll tax for Medicare are immediately paid out to current beneficiaries. Presently Medicare spending accounts for 2.6 percent of GDP and 13 percent of the federal budget. Under current law, these figures are projected to double by 2045.

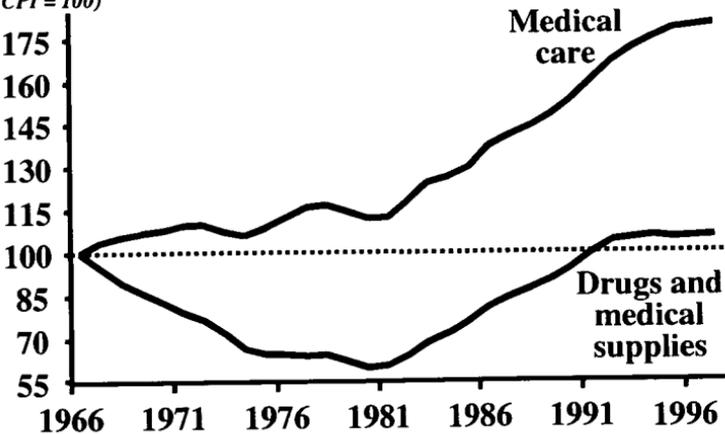
The rapid growth of health care spending to a large extent reflects the nature of the government's involvement. Since 1965, Medicare and Medicaid have subsidized health care for the elderly and the poor. One reason these programs have pushed up prices and spending on health care is that they have increased demand for medical care. The supply of key health care services is highly inelastic, that is, higher prices do not lead to much increase in output. This is perhaps most evident in the case of the services of doctors. Training for doctors is long and rigorous, so an increase in doctors' fees will not quickly increase the number of practicing doctors. Rather, fees will tend to stay high for quite a while.

Exhibit 9: Third-Party Payments and Health Care Inflation

Since 1960, third-party payments for health care have soared while out-of-pocket spending has fallen. The cost of medical services has increased faster than prices in general.



Health care prices relative to CPI (CPI = 100)



Source: Health Care Financing Administration Web site, <http://www.hcfa.gov>.

Note: *There remains a small portion of third-party financing (not included above) composed principally of charitable contributions. For underlying data, see Appendix, tables 3 and 4.

An even more important reason why government health care programs drive prices upward is they virtually eliminate incentives for consumers and suppliers to economize. In a normal market, consumers have a strong incentive to shop around in search of value for money. Because consumers bear the cost of unwise purchases, they seek to avoid high-cost, inefficient suppliers. At the same time, suppliers have a strong incentive to produce efficiently and provide goods at economical prices. Failure to do so will lead to the loss of customers to rivals. Third-party payment of medical bills--the dominant practice in the United States--erodes incentives to keep costs low. When someone else is paying the bill, consumers have little incentive to economize or seek out low-cost suppliers. That reduces incentives for suppliers to produce economically and keep costs low.

As the top panel of Exhibit 9 shows, in 1960 consumers paid directly for about half of all health care spending, while insurance companies and government financed less than a quarter each. The shares changed rapidly after the Medicare and Medicaid programs were established. By the late 1970s, government financed more than 40 percent of all health care spending, and today it finances almost half. Private insurance covers another 31.9 percent, and consumers pay only 17.2 percent directly.

As government subsidies have expanded and direct spending by consumers has fallen, health care prices have risen sharply. The bottom panel of Exhibit 9 details how much faster the prices of medical services have grown than the general level of prices during the last four decades. There is no evidence that the trend is about to subside.

The Future of Health Care

Public policy is the main culprit behind rapidly rising medical costs. Neither suppliers nor consumers have much incentive to economize. The incentive to patronize low-cost, low-price suppliers is weak. Because lower prices will not attract many additional consumers, health-care suppliers have little incentive to keep prices low. As the price of health care continues to rise rapidly, policy makers impose additional mandates and regulations; some even want price controls. The experience of other countries indicates where this will lead. The health care industry is too large, complex, and diverse to centrally plan and regulate. Efforts at central planning will waste resources and produce disappointing results.

Health care costs so much because consumers directly pay for so little of it. When consumers spend their own money, they try to choose wisely and this provides suppliers with a strong incentive to control costs and offer quality service. If health care is to become more

efficient and cost-effective, consumers must have both freedom of choice and incentives to consider costs.

There are two ways to make consumers more aware of costs and give them more freedom of choice than many now have. One way is to encourage increased use of personal Medical Savings Accounts (MSAs). MSAs could be particularly effective combined with medical insurance that carries a high deductible. Retirement MSAs could be used to establish a nest egg for medical expenses during retirement. Under this approach, individuals would pay into MSAs during their working years and the funds would be invested. During retirement, the funds would be used to finance health care and lifetime insurance policies with high deductibles covering catastrophic medical expenses. Like personal savings accounts, MSAs would be the property of individuals. Funds in MSAs could be rolled over from year to year and the unused portion could be passed on to heirs.

Retirement MSAs would induce consumers and suppliers to economize, while stimulating capital formation and economic growth. Research indicates that a payroll contribution of approximately 1.3 percent (rather than the current 2.9 percent) during the working years would be sufficient to cover the cost of medical service during retirement.¹³ Equally important, the percentage would not be affected by demographic changes because each generation would finance its own costs of health care in retirement.

A second way to make consumers more aware of costs would be to shift Medicare at least partly from a reimbursement service to a defined-benefit plan. Under this approach, Medicare recipients would receive a specific amount each year for paying medical bills directly and purchasing private insurance. All Medicare recipients would be required to purchase at least a catastrophic insurance plan. The funds not used in one year could be rolled over for use in subsequent years. This approach would increase the freedom of Medicare recipients to choose the combination of medical services that best fits their personal situation.

One thing is certain: current policy places too much emphasis on the demand side (paying bills) and not enough on the supply side (expanding supply and encouraging economical decisions). Current policy is inefficient because what works for an individual does not necessarily work for a group. One person can spend more on health care and thereby obtain more care. However, when members of a large group simultaneously spend more on health care, prices go up, and

¹³Andrew J. Rettenmaier and Thomas R. Saving, *The Economics of Medicare Reform* (Kalamazoo, Michigan: W. E. Upjohn Institute for Employment Research, forthcoming), chapter 6. Calculations are based on data from the Continuous Medicare History Sample File, 1974-97.

because of rigidities in supply, prices can stay up for a long time.¹⁴ This highlights the need for a more balanced approach to health care policy. Rather than merely increasing demand, it should also focus on the need to expand the supply of medical resources (more doctors and nurses, for example).

III. Education

Increasingly, brains rather than brawn or resources are the basis of economic development and individual wealth. A good education is more important than ever to economic success. For several decades, high-level officials have been telling us that additional funds would improve the quality of public education. This promise is beginning to have a hollow ring. Spending on elementary and secondary education in the United States is high. In 1996, the latest year for which international data are available, public spending on education was 5.4 percent of GDP for the United States versus 5.3 percent for all high-income countries.¹⁵ Public spending per pupil is among the very highest in the world. Moreover, this omits private spending, which is more extensive in the United States than in many other countries.

Despite spending that compares well to other nations by almost any measure, the performance of public elementary and secondary schools in the United States is widely perceived to be mediocre. This reflects too little choice. Empowerment comes from the freedom to choose. With choice, consumers, including students and their parents, shop for and choose the most attractive options. This induces suppliers to cater to their needs and produce efficiently. If consumers do not like the products or prices of a supplier, they seldom complain or organize protests. They have a much stronger weapon: shifting their business elsewhere.

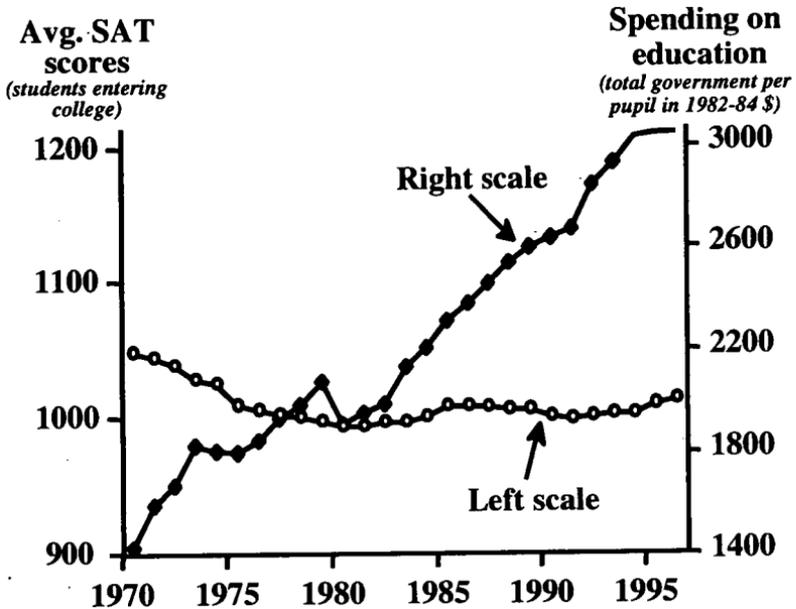
When choice is absent, consumers are unable to weed out inefficient suppliers and those that fail to provide desired products. This is precisely the problem in education. In most states, primary and secondary education is a monopoly. Students are assigned to a particular public school, and it is virtually impossible to escape the grasp of a failing school, particularly for children of parents with low incomes.

¹⁴Higher prices resulting from Medicare also drive up the health care costs and insurance rates of younger people. As health care insurance becomes more expensive, more households decide that it is unaffordable. Thus, the increase in the number of persons without health care insurance accompanying the expansion in Medicare spending is precisely what one would expect.

¹⁵World Bank data. The figure here for the United States differs slightly from that of Exhibit 8 because of recent revisions to U.S. national income accounts.

Exhibit 10: Real Educational Spending and Student Performance

Real spending per pupil on public elementary and secondary education doubled from 1970 to 1996, yet SAT scores fell.



Sources: *Digest of Education Statistics*, various issues; College Board Web site, <http://www.collegeboard.org>; Haver Analytics.

Note: For underlying data, see Appendix, table 5.

As Exhibit 10 illustrates, since 1970 real spending per pupil on elementary and secondary education has approximately doubled. Despite this increase, achievement scores fell in the 1970s, held steady in the 1980s, and crept up only a little during the 1990s. Cross-country comparisons of achievement scores also illustrate the weak performance of U.S. schools. The Third International Mathematics and Science Study, which compared achievement in 41 countries, found that even though U.S. fourth-graders scored above the international average in math and science, the scores of twelfth-graders were well below average. The achievement scores of older U.S. elementary students and secondary students lag well behind those of most developed countries.

The situation is quite different at the college and university level. In higher education, students choose the schools they attend and financial aid is more readily available, increasing the effective competition between private and public schools. The United States leads the world in the variety of programs offered, eminence of researchers, quality of facilities, and percentage of high school graduates who participate.

In its proposed budget for 2001, the Clinton Administration seeks to boost federal spending on primary and secondary education from \$17.2 billion to \$26.8 billion. Unfortunately, its approach is to continue federal direction of resources. The federal government is ill suited for assessing the diverse needs of the more than 50 million students in America's primary and secondary schools. State and local governments are much closer to the students and better able to assess how best to spend money on education. It is desirable to give state and local governments flexibility over the use of federal funds given to them for education, because the needs of students vary from place to place.

It is also desirable to encourage more choice in primary and secondary education. Several promising choice initiatives are already underway at the state and local level. These include Florida's A-Plus Education Plan, which sets clear standards for public schools and pays for students in poorly performing schools who wish to transfer to other public schools or participating private schools; state and locally funded school voucher programs in Milwaukee, Cleveland, and elsewhere; and privately funded efforts to offer scholarships to low-income families in some of the country's worst-performing school districts.

Choice is essential for the improvement of elementary and secondary education. Without choice, experience indicates that more money will yield only further disappointing results. The federal government should encourage the initiation and expansion of choice programs. Voucher programs that pay some or all of the tuition at private primary and secondary schools already exist in other countries, including Chile, Colombia, the Netherlands, Sweden, and even post-communist Russia. If the United States is to keep up and excel in this crucial area, Americans, including those with low incomes, must have greater opportunity to choose the schools that best meet the educational needs of their children.¹⁶

¹⁶For an international perspective on choice in education, see Harry Anthony Patrinos, "Market Forces in Education," World Bank paper, July 1999, available online at <http://www.worldbank.org/edinvest/Market_HP.html>.

3. PROMOTING A MORE OPEN ECONOMY

Openness to trade plays a crucial part in improving living standards. Imagine how wasteful it would be if each of the 50 states had to grow all its own oranges, produce all its own oil, or make all the movies shown within its borders. It is far more efficient for Florida to grow oranges, Texas to produce oil, California to make movies, and so on, then trade those things for the goods other states make best. In essence, the United States is a large free trade zone. This is an important factor that has contributed to our growth and long-term success. Just as domestic trade makes it possible for Americans in each of the 50 states to achieve higher income levels, international trade makes it possible for citizens in different countries to achieve higher living standards.

Economics indicates that residents of a country will be more prosperous when they are permitted to buy from suppliers offering the best deal and sell to purchasers willing to pay the most attractive prices. To test this proposition, the staff of the Joint Economic Committee developed a Trade Openness Index. This index measures the degree to which citizens in various countries are free to exchange goods, services, and capital assets with residents of other countries. The index is based on four factors: (1) tariff rates, (2) presence or absence of a black market for foreign currency, (3) size of the trade sector as a share of the economy, and (4) restrictions on capital movements. High ratings are given to countries with low tariffs, no black market for foreign exchange, a large trade sector (given the country's size and locational characteristics), and few restrictions on the inflow or outflow of capital.¹⁷

It was possible to derive the index for 97 countries and four time periods during the last two decades (1980-82, 1985-87, 1990-92, and 1995-97). Exhibit 11 illustrates the relationship between openness and economic growth for the countries with the 12 highest and 12 lowest

¹⁷The four components of the index were weighted equally. The country data on tariffs, black market exchange rate premiums, the actual size of the trade sector relative to the expected size, and a categorical rating indicative of capital market restrictions were all placed on a 0 to 10 scale. For details, see James Gwartney and Robert Lawson, *Economic Freedom of the World: 2000 Annual Report* (Vancouver: Fraser Institute, 2000). The expected size of the trade sector is influenced by both country size and location. Thus, the model used to estimate the expected size of the trade sector is adjusted for size of country (population and geographic area) and locational characteristics (length of coastline and distance from concentrations of demand). The Joint Economic Committee will publish a more comprehensive report on international trade and economic growth later this year.

Exhibit 11: Trade Openness, Income, and Growth

	Trade Openness Index (avg) 1980-97	Real GDP per person 1997	Avg annual growth of real GDP per person 1980-97
<i>Most open economies</i>			
Hong Kong	9.9	\$26,150	4.7%
Singapore	9.8	\$30,756	5.8%
Belgium	9.0	\$23,763	1.7%
Panama	8.8	\$7,521	0.7%
Luxembourg	8.5	\$36,190	3.7%
Germany	8.5	\$22,693	1.6% *
United Kingdom	8.4	\$21,825	1.8%
United States	8.4	\$30,610	1.6%
Netherlands	8.4	\$22,717	1.6%
Switzerland	8.1	\$27,985	0.8%
Malaysia	7.9	\$11,274	4.2%
Canada	7.7	\$23,272	1.2%
<i>Average</i>	8.6	\$23,730	2.3%
<i>Least open economies</i>			
Algeria	3.0	\$4,887	-0.9%
Madagascar	3.0	\$971	-2.2%
Nigeria	2.9	\$935	-0.9%
Argentina	2.8	\$10,600	0.4%
Ghana	2.8	\$1,913	-0.1%
Syria	2.4	\$3,182	1.0%
Uganda	2.4	\$1,117	2.2% *
Iran	2.0	\$6,206	-0.2%
Burundi	1.4	\$646	-1.2%
Sierra Leone	1.4	\$538	-3.9%
Bangladesh	0.6	\$1,117	2.4%
Myanmar	0.2	\$1,287	1.7%
<i>Average</i>	2.1	\$2,783	-0.3%

Sources: Trade openness (0-10 scale) derived by JEC staff. Data are from CIA, *Handbook of International Financial Statistics*; World Bank, *World Development Indicators, 1999*; IMF, *International Financial Statistics Yearbook, 1999*. GDP per person is in 1998 dollars, derived by purchasing power parity method. Growth rates derived from real local currency units.

Note: *Data for Germany are for West Germany only prior to unification. Due to data restrictions, Uganda's average annual growth is based upon growth only since 1982. For entire series, see Appendix, table 6.

average ratings for openness during these four periods. The 12 most open economies had low tariffs, liberal currency conversion policies, large trade sectors, and few restraints on the inflow and outflow of capital. Hong Kong, Singapore, Belgium, Panama, Luxembourg, and Germany head the list; the United States ranks seventh, tied with the United Kingdom and the Netherlands. In contrast, the least open economies—Myanmar, Bangladesh, Sierra Leone, Burundi, Iran, Uganda, and Syria—persistently followed policies that restricted trade.

If trade makes a difference, countries that are open over a long time should both achieve higher levels of income and grow faster.¹⁸ As Exhibit 11 shows, this has indeed been the case. The GDP per person of the 12 most open economies in 1997 averaged \$23,730—more than eight times the average of \$2,783 for the 12 least open economies. The 12 most open economies grew on average 2.3 percent a year during 1980-97, compared to *minus* 0.3 percent a year for the 12 least open economies. The striking differences in both the income levels and growth rates illustrate the importance of international trade as a source of growth and prosperity.¹⁹

I. The Trade Record of the Clinton Administration

The Clinton Administration has generally supported economic openness and the President's Council of Economic Advisers has consistently presented the case for free trade.²⁰ President Clinton deserves high marks for lobbying reluctant members of his own party on behalf of the North American Free Trade Agreement (NAFTA). Without these efforts, the agreement could not have been passed. Recently, however, Administration leadership on behalf of free trade has been lacking. The Administration's insistence on bringing labor and environmental regulations into the World Trade Organization

¹⁸For an excellent technical analysis of the relationship between international trade in economic growth, see Jeffrey A. Frankel and David Romer, "Does Trade Cause Growth?," *American Economic Review*, June 1999.

¹⁹The high incomes of the open economies reflect factors other than the direct impact of international trade. The more open economies have also followed monetary, fiscal, and regulatory policies more consistent with high rates of investment and rapid economic growth. This highlights another important point: openness gives policy makers strong incentives to establish an environment that is attractive for investment in physical capital, education, and technology. Failure to do so will result in low investment rates, capital flight, and a "brain drain." Thus, in addition to its direct effects, openness indirectly promotes growth by encouraging the adoption of sound policies in other areas.

²⁰See *Economic Report of the President 2000*, chapter 6.

(WTO) has, at least for now, undermined the WTO's effectiveness as a force for trade liberalization.

The focus of the General Agreement on Tariffs and Trade (GATT), the predecessor of the WTO, was on the reduction of tariffs and the elimination of quotas and other regulatory barriers that restrict trade. GATT was effective precisely because it focused on deregulation. If the WTO is going to be effective, it must follow the same course. It would be a major mistake to burden the WTO with new regulatory responsibilities. Other organizations, notably the International Labor Organization and the United Nations Environmental Program, already exist as forums for handling labor and environmental issues, and they are more likely to achieve progress by keeping their affairs separate from those of the WTO.

Low-income countries resent the imposition of labor and environmental regulations by the United States and other high-income countries.²¹ They argue that such regulations are nothing more than a disguised form of protectionism. They have a strong case. Their labor and environmental standards are much like those the United States itself had a century ago, when it had a comparable income level. In 1900, most Americans began their working lives by the time they finished eighth grade. The air in American cities was thick with coal dust from thousands of stoves and furnaces, and drinking water was often infested with disease-causing organisms from raw sewage dumped by cities upstream. In those days, Americans wanted education for their children and a clean environment just as much as they do now; the problem was how to afford them.

The United States now has universal education through twelfth grade and better pollution control mainly because we are far wealthier than our great-grandparents were, not because we have better regulations or more noble intentions. Pressuring developing countries to adopt our labor and environmental standards prematurely may actually impede their advance toward the standards by slowing their economic growth. Most already have met or are striving to meet minimum standards governing such areas as prohibition of forced labor and cross-border pollution. As they grow richer, their own citizens will want them to have standards more like ours. Moreover, the United States remains free to set standards so that imported goods meet our norms for health and safety.

²¹Labor and environmental standards were part of NAFTA. NAFTA, however, was an agreement among just three countries in the same region that had considerable experience in negotiating a wide range of issues related to their common borders. WTO agreements are far different. They involve 135 countries scattered across the globe. It is difficult to get a substantial majority of 135 countries to agree on anything.

If the Clinton Administration is really interested in improving labor standards and environmental regulations around the world, the most constructive thing it could do would be to push for free trade. As both economic theory and historical experience illustrate, open markets will promote growth and prosperity. As the income levels of countries improve, so too will working conditions, educational levels, and the demand for stricter environmental controls. Free trade and improvements in working conditions and environmental quality are friends, not enemies.

II. The Future Direction of Trade Policy

What specifically should the United States be doing to promote more open markets and freer trade across national borders? The House and Senate have approved legislation that would reduce tariffs and liberalize trade with Caribbean and African countries. The legislation, now in conference committee, should be enacted into law.

Steps need to be taken to repair the recent damage imposed on the WTO and restore it as an effective organization for trade liberalization. In the short term, however, a more promising course may be to expand NAFTA, and thereby create an even larger free trade zone. Several Latin American and Pacific Rim countries—including Argentina, Chile, Australia, New Zealand, and Singapore—are leading candidates for NAFTA expansion. These countries already have labor standards and, to a lesser extent, environmental standards similar to those embodied in the NAFTA treaty.²²

Finally, it may be time for the United States to consider seriously unilaterally phasing out its tariffs and quotas. If they were phased out over 10 or 15 years, domestic industries would have ample opportunity to adjust to the more competitive environment. All trade barriers, whether imposed domestically or by one's trading partners, reduce the volume of trade and deter the achievement of maximum sustainable output. In addition, quotas also result in wasteful use of resources in an effort to circumvent trade barriers. The United States could both help

²²In contrast with President Clinton's praise for the demonstrators in Seattle, Mexican president Ernesto Zedillo denounced them as self-appointed representatives out to "save the people of developing countries from development." Despite the setback in Seattle, Mexico continues to move toward trade liberalization. Most recently, it signed a far-reaching free trade agreement with the European Union. Previously, Mexico had reached free trade agreements with Bolivia, Chile, Colombia, Costa Rica, Israel, Nicaragua, and Venezuela. The United States should follow a similar path and continue to expand the area in which Americans are permitted to enjoy the benefits of free exchange.

itself and set an example for the rest of the world to emulate by following this course of action.²³

²³Currently, the United States imposes more than 1,000 import allotments that set the quantities of various products that a country can supply to the U.S. market. Quotas are particularly attractive to the foreign suppliers that possess them because they can sell to U.S. consumers at prices above the world market level. Politically powerful foreigners often control quotas, which they trade openly like stock options. Foreign producers use circuitous shipping routes, fraudulent labeling, political contributions, and outright bribes in order to sell their goods in the U.S. market. In an effort to stifle the process, the U.S. government employs additional customs officials. All of this results in waste, corruption, higher taxes, and higher prices for U.S. consumers.

4. PROMOTING SOUND MONETARY POLICY AT HOME AND ABROAD

A sound currency facilitates trade by providing a reliable means of making payments, whereas a bad currency hinders trade by creating doubt that it is worthwhile to accept the currency. An unsound currency is a type of trade barrier, because a sudden depreciation of the currency--such as occurs during a currency crisis--can temporarily boost exports and choke imports much as a tariff would. For liberalization of trade to achieve its full potential, it needs to occur in a context of sound currencies. The implication for economic growth is that the United States should promote sound monetary policy both at home and abroad.

In the 1980s and 1990s, the Federal Reserve System painstakingly rebuilt the credibility it had lost in the 1970s. It had support from succeeding administrations to do so, including the Clinton Administration under Treasury Secretary Robert Rubin. Today, people around the world have confidence that inflation will remain low in the United States. This benefits lenders and borrowers alike: lenders are reassured that inflation will not rob them of their savings, while borrowers pay lower rates of interest than they would in most other currencies. It is highly desirable that the dollar continue to have high credibility. A good way to ensure that is to reform the legislative mandate of the Federal Reserve System. Agreement is spreading among economists that central banks in countries with floating exchange rates should focus on price stability as their main long-term goal. The Humphrey-Hawkins Act gives the Federal Reserve multiple, contradictory goals. The act should be revised to conform to the policy the Federal Reserve is already following in fact. That would strengthen the ability of the Federal Reserve to resist pressure for inflation.²⁴

The high credibility the dollar enjoys is rare. Among the world's 150 or so currencies, only the dollar, the euro, the Japanese yen, and a few others such as the Swiss franc and British pound are trusted enough to be internationally acceptable. Most other countries have currencies that are unsound and suffer periodic currency crises as a result. In 1997, East Asian countries were affected; in 1998, Russia; and in 1999, Brazil and Ecuador. The frequency of currency crises in the 1990s has resulted in calls for a "new international financial architecture." The Group of Seven (G-7) nations and other official and unofficial groups have held numerous meetings and issued many

²⁴Senator Connie Mack's Economic Growth and Price Stability Act (S. 1492) would make price stability the main long-term goal for the Federal Reserve.

papers on various aspects of the subject. So far, proposals for reform have produced few concrete results.

International agreement on a new international financial architecture is likely to be slow and move in small steps. However, the United States can do much on its own to make the international monetary system more stable. Most important, it can offer countries that have unsound currencies an incentive to replace them fully with the dollar. The International Monetary Stability Act (S. 2101 and H.R. 3493), introduced by Senators Connie Mack (R-Florida) and Robert Bennett (R-Utah) and Representative Paul Ryan (R-Wisconsin), would allow the Secretary of the Treasury to share with countries that become officially dollarized some of the extra revenue the United States would earn. This would reduce the loss of revenue dollarized countries would experience from ceasing to issue their own currencies, which at present constitutes an important political obstacle to dollarization.

Until this year, Panama, which has fewer than 3 million people, was the largest independent dollarized country, and no country had become officially dollarized for decades. However, in January Ecuador, whose population exceeds 12 million people, announced its intention to become officially dollarized. Despite intervening political difficulties that included a change of government, in March Ecuador began replacing its domestic currency, the *sucre*, with dollar notes. Dollarization is expected to be complete within six months. East Timor, which recently became independent again after a quarter-century of Indonesian occupation, announced in January that it would replace the Indonesian rupiah with the dollar as its official currency. Currently East Timor is under United Nations administration, and it is undetermined how long dollarization will persist after East Timor becomes fully self-governing.

Official dollarization has also been much discussed in a number of other Latin American countries, particularly El Salvador and Argentina. The Clinton Administration has been timid about dollarization, stressing the potential risks other countries incur when they give up the right to issue their own currency. It is in the interest of the United States to note the benefits of dollarization as well and to make a positive case for dollarization. Spreading a sound currency to more countries would benefit them by promoting higher economic growth and benefit us by reducing the cost of international transactions and expanding the number of foreign consumers able to buy American goods.

Dollarization should be completely voluntary: the United States should not exert pressure on any country to dollarize. However, it is perfectly appropriate for the United States to point out that many countries have been unable to provide sound currencies for their

citizens despite experimenting with a wide range of monetary policies. Dollarization works well, whereas most other policies have not. Dollarization works because it denies a government the ability to finance budget deficits by creating inflation. That eliminates one of the main obstacles to higher economic growth in many countries. Dollarization has no preconditions; rather, by establishing a sound currency, it tends to create and enforce a framework for sound economic policies. Dollarization cannot by itself cure all of a country's economic problems, but by bringing greater stability to monetary policy and promoting transparency in government finance, it improves the chance of addressing many problems effectively.²⁵

²⁵See Joint Economic Committee, Office of the Chairman, "Basics of Dollarization," staff report, January 2000. This and other materials on dollarization are available at <<http://www.senate.gov/~jec/dollarnews.htm>>. On the benefits of a common currency for international trade, see Andrew K. Rose, "One Money, One Market: Estimating the Effect of Common Currencies on Trade," working paper, Haas School of Business, University of California-Berkeley, 17 February 2000; the full text is available online at <<http://haas.berkeley.edu/~arose/Grav.pdf>>.

5. MAKING THE INTERNATIONAL MONETARY FUND MORE EFFECTIVE

If steps are taken to establish a new international financial architecture through multinational action, they are likely to involve the International Monetary Fund (IMF). The United States has a leading role in the IMF because it is the organization's largest contributor. The IMF was established in 1945 to finance temporary balance of payments problems under the system of pegged exchange rates that existed from 1945 to 1973. Under the flexible exchange rates that have existed among the major currencies since 1973, the IMF's focus has become less clear.

I. Problems with IMF Lending

Loans by the IMF are potentially (though not always) stabilizing in the short run, but create some long-term problems.

Moral hazard. Loans may encourage reckless behavior, which economists call "moral hazard." Borrowers and lenders recognize that their national governments, backed by the IMF, will likely rescue them if they behave imprudently on a sufficiently large scale.

Inappropriate conditions attached to loans. The IMF typically imposes certain conditions on the loans it makes. Too often, one of the conditions is that recipient countries increase tax rates. That hampers economic growth by penalizing effort. Moreover, in a number of recent loans the IMF has required recipient countries to restructure entire sectors of their economies. Neither the IMF nor any other international organization has the knowledge and personnel to design such restructurings well. At the same time, the IMF has paid insufficient attention to promoting durable stabilization of currencies. The most noteworthy example is Indonesia, where the IMF in 1998 discouraged the government from using a currency board despite the success of currency boards elsewhere.²⁶ A collapse of the currency, economic depression, riots, and resignation of the president followed.

Cost to U.S. taxpayers. The Clinton Administration has claimed there is no cost associated with U.S. contributions to the IMF. The IMF's base rate for loans, currently less than 5 percent, is comparable to or even below the rates the United States and other highly creditworthy governments pay in open markets. But almost all IMF

²⁶Paul Blustein, "Suharto Reconsidering Currency Policy; IMF Opposed Indonesian Leader's Plans to Peg Rupiah to Dollar," *Washington Post*, February 22, 1998, p. A24; Steve H. Hanke, "How I Spent My Spring Vacation," *The International Economy*, July-August 1998.

loans are made to less creditworthy governments who would pay much higher rates in open markets. The rates the IMF charges them do not adequately reflect their potential risk, and thereby exacerbate the moral hazard problem discussed above. Subsidized loans are not necessary to assist illiquid borrowers and are counterproductive for insolvent entities.

Lack of transparency. In response to pressure from the U.S. Congress and governments of other countries, the IMF now releases more information about its activities on its Web site and in print. This is a welcome development, but the IMF's policies (and the policies of the U.S. Treasury when it supports IMF loans) are still too ill defined and secretive.

II. Reforming the IMF

The IMF has drifted into areas unrelated to its core mission of financing temporary balance of payments problems. Its far-flung economic development and structural lending projects duplicate the activities of its sister organization, the World Bank. To address these problems, the Congress established a bipartisan International Financial Institution Advisory Commission, which completed its work and presented a report in March 2000.²⁷ The report contains many suggestions for improving the performance of the IMF and other international financial institutions. Among its findings are these:

The IMF and other international financial institutions should write off their debt to certain very poor countries that simply cannot repay it. Congressional impetus for this idea, known as the HIPC (Highly Indebted Poor Countries) initiative, was bipartisan and incorporated into law (Public Law 106-113). The IMF is making de facto writeoffs for some countries through complex accounting transactions that revalue to more realistic levels the gold it holds. In return for the writeoffs, countries agree to structural reforms to promote economic growth and prevent them from making the same mistakes again. Unlike the structural reforms agreed to in IMF loans

²⁷The full text of the report of the commission is available online at <<http://phantom-x.gsia.cmu.edu/IFIAC/USMRPTDV.html>>. The Treasury has made some highly inaccurate criticisms of the report; see the testimony of Treasury Secretary Lawrence Summers to the House of Representatives Committee on Banking, March 23, 2000, available online at <<http://www.house.gov/banking/32300sum.htm>>. Representative Jim Saxton (R-New Jersey) introduced the IMF Reform Act of 2000 in February (H.R. 3750) to address some of the same issues covered by the commission. The text of the bill is available online at <<http://www.house.gov/jec/imf/2-29-leg.pdf>>.

that have more of an emergency character, these reforms are the result of more deliberation and more initiative from indebted countries.

The IMF should restrict its lending to providing temporary liquidity, and cease making long-term loans for other purposes. This would return the IMF to its core mission. The report of the commission suggests the IMF charge rates of interest above recent market rates so that countries borrow from it only when they are really in trouble. The report also proposes allowing countries to qualify automatically for loans if they meet certain international standards. Countries that do not qualify would still be eligible to borrow, but on less favorable terms and with more supervision by the IMF. The IMF should not be involved in restructuring entire sectors of national economies, such as automobiles or food distribution.

The IMF should improve its transparency further. It should disseminate its so-called Article IV reports and other country information that, at the request of some member countries, is now confidential. Also, it should publish minutes of the meetings of its executive board, with a suitable lag, and should reformat its balance sheet to be more understandable. At present, the balance sheet contains no direct information on how much the IMF has lent or how liquid its various assets and liabilities are.

The IMF has sufficient assets to borrow from international capital markets should it need to expand its capacity to lend in the near future. It is not necessary for U.S. taxpayers to put more money into the IMF through an increase in the U.S. contribution.

Countries should choose either firmly fixed exchange rates (dollarization or currency boards) or fluctuating rates. As officials of the U.S. Treasury have also said, mixed systems such as pegged exchange rates have proved to work poorly. The IMF should not force countries to give up pegged exchange rates, but it should not lend to support them and should tell countries that its best advice is to avoid pegged rates. The commission was silent about the choice between fixed and fluctuating rates, but experience indicates that fluctuating rates work better in developed countries than in developing countries.

The Commission's recommendations are sound and they should be implemented. The report of the commission proposes a phase-in period of three to five years to implement these and other recommendations. That is ample time to allow countries to adjust to the new rules under which the commission recommends the IMF operate.

6. REDUCING THE BURDEN OF FEDERAL TAXES

I. The Size of the Federal Tax Burden

Just eleven years after breaching the \$1 trillion revenue barrier in 1990, the federal government is expected to top \$2 trillion in revenue in the coming fiscal year. The strong economy has fueled record tax collections from the income, payroll, and excise tax systems. Since 1992, federal revenues have risen 79 percent, compared to a 54 percent rise in nominal GDP.²⁸

In earlier times, the federal government could rely on a few simple tax mechanisms to collect the resources that it needed. In 1900, federal taxes represented just 2.4 percent of GDP, which was collected without the need for payroll taxes or individual and corporate income taxes. Customs dues and excise taxes generated 91 percent of federal taxes back then. It cost the Treasury about \$12 million to collect taxes and customs dues in 1900, and required roughly 10,000 workers.²⁹

Today, federal revenues are 20 percent of GDP, meaning that one-fifth of the value of everything produced is channeled through Washington, D.C. Numerous and complex tax collection systems are needed to tap into different pools of income in the economy. The IRS now employs 100,000 workers with an \$8.2 billion budget.

It is useful to occasionally step back and ask: who really pays the \$2 trillion in taxes, and how does its collection affect the performance of the economy?

II. Who Pays Federal Taxes?

Personal income taxes account for 49 percent of federal revenues; Social Security and Medicare payroll taxes account for 33 percent; corporate income taxes account for 10 percent; and other taxes account for 8 percent. Each source of federal tax revenue imposes a distinct cost on American families in their roles as workers, consumers, savers, and entrepreneurs. The actual burden of a tax may be distinct from the source of collection. Following is a brief description of the burden of each major tax.

²⁸Data from the Office of Management and Budget for fiscal years; figure for 2001 is estimated.

²⁹*Statistical Abstract of the United States*, 1902; U.S. Treasury, *Annual Report of the Secretary of Treasury*, Fiscal Year 1900; and Joint Economic Committee estimates.

Exhibit 12: Individual Income Tax Shares
Over the last two decades, high-income taxpayers have paid an increasing share of federal personal income taxes.

Income group	Share of total federal personal income tax paid		
	1980	1990	1997
Top 1%	19.1%	25.1%	33.2%
Top 5%	36.8%	43.6%	51.9%
Top 10%	49.3%	55.4%	63.2%
Next 40%	43.7%	38.8%	32.5%
Bottom 50%	7.0%	5.8%	4.3%

Source: Internal Revenue Service.

Note: For entire series, see Appendix, table 8.

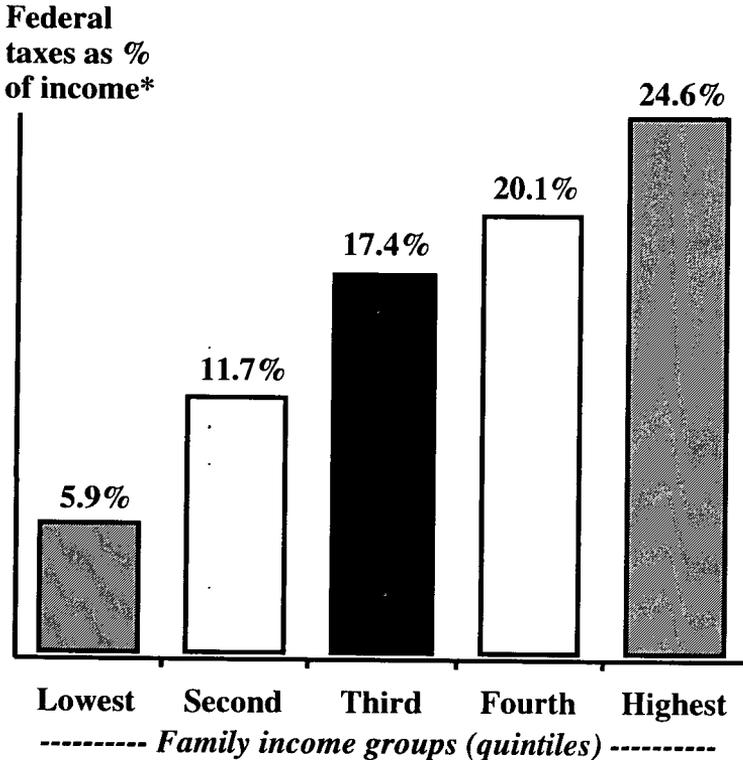
- Personal income taxes.** The personal income tax burden is highly skewed towards upper-income individuals. As the IRS data of Exhibit 12 show, the top 5 percent of tax-filing families paid 51.9 percent of the federal personal income taxes in 1997, up from 43.6 percent in 1990 and 36.8 percent in 1980.³⁰ The top 10 percent of earners paid 63.2 percent of the 1997 federal income tax. While the revenue collected from the top group has risen, the share paid by the bottom 90 percent of taxpayers has fallen. Interestingly, this was true during both the 1980s, when marginal rates were reduced, and during the 1990s, when except for the capital gains rate, the top marginal rates were increased. The standard deduction and other provisions exempt millions of lower-income families from taxation, so that just 64 percent of U.S. families are expected to pay income tax in 1999.³¹
- Payroll taxes.** The combined Social Security and Medicare payroll tax of 15.3 percent imposes a heavy burden on all employed and self-employed families, since it applies to wages from the first

³⁰Internal Revenue Service, *SOI Bulletin*, Spring 1999, and electronic data from the IRS for 1997. See Appendix, table 8, for annual data on the shares of personal income taxes paid by various income groups since 1980.

³¹U.S. Congress, Joint Committee on Taxation, "Estimates of Federal Tax Expenditures for Fiscal Years 2000-2004," JCS-13-99, December 22, 1999.

Exhibit 13: Total Federal Taxes as a Share of Income

The higher the income, the greater the share of earnings a family pays in federal tax.



Source: Treasury Department. Income is "Family Economic Income."

Note: *Total federal taxes include income, excise, payroll, and estate taxes.

dollar earned. About 80 percent of working families pay more payroll taxes than they do income taxes.³²

- **Corporate income taxes.** The corporate income tax is passed through businesses to shareholders, debt holders, workers, consumers, or some combination. The tax is highly complex and

³²Congressional Budget Office, "Estimates of Federal Tax Liabilities for Individuals and Families by Income Category and Family Type for 1995 and 1999," May 1998.

creates a hidden burden of taxation that many Americans are unaware that they pay.

- **Other taxes.** Consumers pay federal excise taxes on a variety of products including cigarettes, gasoline, alcohol, telephone service, and other items. The federal estate and gift tax, also known as the death tax, can be thought of as falling on either deceased people or their heirs. It is considered unjust by many, and can impede the transfer of family businesses such as farms and shops.

All in all, the federal tax system is highly progressive, meaning that lower-income families pay a smaller share of income in taxes than higher-income families. Exhibit 13 shows Treasury Department estimates of average tax burdens for U.S. families grouped into five income groups for 2000. Families in the highest fifth will pay 24.6 percent of income in federal taxes this year, on average, while families in the lowest fifth will pay 5.9 percent.

III. Problems Created by the High Tax Burden

While the \$2 trillion of federal taxes collected each year do fund many useful and desirable programs, they also create an array of damaging side effects on the nation's economy. The most obvious impact, of course, is that individuals lose control of earnings sent to Washington, and as a result may be short of funds needed to finance their own family's food, housing, or health care needs.

The actual transfer of resources from individuals to the government through taxation is far from frictionless. A tax dollar extracted from an individual or a business ends up costing the private economy much more than just one dollar. This is the case for two main reasons.

First, tax design, collection, and enforcement is costly and requires many highly skilled experts who would otherwise be producing useful goods and services for consumption. In addition to the IRS's 100,000 employees, every business in America must employ tax accountants, bookkeepers, and lawyers to tabulate and collect the required taxes. In turn, they hire tens of thousands of outside accountants and lawyers to figure out how much is owed, devise plans to minimize next year's tax bill, and do battle in the tax courts. For example, U.S. businesses spend roughly \$5 billion each year in tax consulting fees to the Big Five accounting firms, let alone fees paid to smaller accounting firms, law firms, and other consultants. One estimate placed the total cost of tax compliance for U.S. businesses at \$150 billion.³³

³³Tax Foundation *Special Brief* by Arthur Hall, March 1996.

The Office of Management and Budget estimates that individuals and businesses will spend over 6 billion hours (3 million person-years) filling out tax forms this year, including hours spent record-keeping and learning the tax rules.³⁴ The tax code has gotten so complicated that more than half of U.S. families now use tax preparation firms to make sure they comply with the complex rules. These firms, such as H&R Block and Jackson Hewitt, have seen their businesses soar. H&R Block's 1999 revenues from tax operations of \$1.3 billion are up 30 percent in the past two years.

A second, larger burden to the economy than the actual tax collection costs are the incentive and disincentive effects created by the tax code on individual and business behavior. High marginal tax rates in the personal income tax code dissuade individuals from extra work effort, saving for retirement, or taking risks to start and grow businesses.

The highly complex corporate income tax system has a wide-ranging impact on how American businesses structure themselves and conduct their operations. Business decisions such as how much new machinery should be purchased, where new facilities should be located, how employees should be compensated, how many workers should be hired, and what type of pension plan to offer, are all affected by tax rules. The result is that billions of dollars of economic resources are being moved around in response to tax rules, and not being allocated to uses that maximize economic growth.

In summary, larger tax burdens mean that more skilled people are engaged in zero-sum work, and that more economic decisions are made with regard to tax considerations, rather than individual choice and maximum efficiency. While taxes are required to fund the necessary functions of government, a simplified tax system can minimize these negative side effects. At the heart of tax reform ideas, such as the flat tax and the national retail sales tax, is the goal of minimizing distortions and waste in the current system.

But before the country moves towards a major tax reform, the federal tax system can be updated and improved with some smaller reforms. The next section briefly summarizes some first steps towards a new tax system for the 21st century.

IV. First Steps to a Simpler and More Efficient Tax System

Reduce income taxes on savings and investment. America's income tax system is widely recognized to create a bias against savings

³⁴Office of Management and Budget, *Information Collection Budget of the United States Government*, fiscal year 1999.

and investment. Because savings and investment are crucial to sustaining strong economic growth, reforms should be enacted to reduce this distortion.

A main source of the problem is that earnings from corporate investments are taxed at both the corporate level and the individual level. Corporate profits generated by investments in machines and equipment first incur a 35 percent corporate income tax.³⁵ Then a portion of earnings are distributed to individual shareholders in the form of dividends, which are subject to ordinary income tax rates of up to 39.6 percent (plus state and local income taxes). If corporations retain after-tax profits, company valuation will increase as share prices rise. Ultimately shareholders will pay tax on the rising share prices when they realize capital gains, or may pay the estate tax on the fair market value of their shares when they die, at a top rate of 55 percent.

Consider a corporation that earns \$1 per share, pays 35 cents in corporate income tax and distributes the remaining 65 cents. Individual shareholders in the 39.6 percent tax bracket will end up with just 39 cents from the original \$1 in earnings. In this case, the effective marginal tax rate on the \$1 of earnings is 61 percent. Even taxpayers in the 15 percent bracket confront an effective tax rate of 45 percent on their corporate earnings, leaving them with only 55 cents of each dollar earned by their corporate assets. The effect is to reduce the return on equity investment, which may reduce the pool of capital available for business investment, and may bias businesses toward debt financing, since interest is a deductible expense at the corporate level.

While many other industrial countries have a higher overall level of taxes than the United States, most nonetheless have income tax systems that contain provisions to reduce the double-tax burden on corporate equity. The double layer of tax may be reduced by lowering the tax on dividends and capital gains at the individual level, or allowing businesses to deduct dividends at the corporate level.

Other aspects of the income tax system are also investment-unfriendly for U.S. businesses seeking to compete in the global economy. For example, the rapid obsolescence of new technologies is not fully reflected in tax depreciation rules. Semiconductor and printed circuit board manufacturing equipment must be written off over five years, but often becomes obsolete in three. A number of other industrial countries have more competitive depreciation treatment for technology equipment.³⁶

³⁵Moreover, to the extent that depreciation schedules do not allow the equipment to be fully expensed, the initial investment is also subject to additional tax.

³⁶Testimony by the American Council for Capital Formation before the Senate Budget Committee, January 20, 1999. The Treasury Department is conducting

In summary, through multiple tax layers, high marginal rates, and uncompetitive depreciation rules, the income tax system creates disincentives to savings and investment. The benefits of reducing these burdens would include greater efficiency, reduced business debt levels, greater capital formation, and faster economic growth.

Reduce the marriage penalty. Substantial concern has been expressed in recent years regarding features of the income tax code that creates “marriage penalties.” These occur because the tax code does not treat a married couple as equal partners in earning the couple’s total income.

Marriage penalties are mainly caused by the breakpoints between tax brackets for married taxpayers (which are not twice the breakpoints for single taxpayers), and the standard deduction for married taxpayers (which is not twice that for single taxpayers). In 2000, the standard deduction is \$4,400 for singles, but only \$7,350 for married couples. Similarly, the 28 percent tax rate bracket begins at \$26,250 for singles, but only \$43,850 for married couples. At the top end of the income spectrum, marriage penalties become severe. This is because the income breakpoint for the 39.6 percent rate is the same for singles as for married couples. A straightforward way to reduce marriage penalties is to make the standard deduction and the tax breakpoints for married couples twice the amounts for singles.³⁷

Make health insurance deductible for individuals. Health care insurance is an important component of employee compensation for most workers. There are two main reasons why employers and employees benefit from inclusion of health insurance in compensation packages: lower costs as the result of economies of group purchase, and employer tax advantages. As a result, about two-thirds of non-elderly adults receive health insurance through group plans offered by their employers.

When employees receive health insurance benefits as part of their compensation package, the benefits are generally not taxed at the employer or employee level. By contrast, families and individuals purchasing health insurance directly must generally do so with after-tax earnings.³⁸ This difference in tax treatment makes the direct

an extensive study of depreciation periods and methods, which will be completed later this year.

³⁷This has been proposed in the Marriage Tax Relief Act of 2000, which has been passed by the Senate Finance Committee and awaits action by the full Senate.

³⁸However, taxpayers who itemize can deduct some medical expenses, but only to the extent that their total medical expenses exceed 7.5 percent of adjusted gross income. Self-employed individuals can currently deduct 60

purchase of health insurance more costly, creating an unfair bias against families not receiving benefits through work.

This unequal treatment is a historical relic dating back to World War II. At the time, employers provided health insurance as a means to escape wage controls. Because health insurance was not counted as a wage increase, it enabled employers to raise total compensation and attract additional workers. The rule distorts personal decision-making and reduces the competitiveness of the health insurance industry. In today's world, the rule is indefensible. Legislation making the direct purchase of health insurance fully deductible for all families should be adopted. Provisions in the Taxpayer Refund and Relief Act of 1999 would have accomplished this, but President Clinton vetoed the act.

Repeal the Alternative Minimum Tax. Congress adopted the Alternative Minimum Tax (AMT) to ensure that high-income taxpayers would pay their fair share of taxes. Unfortunately, this goal was accomplished at a very high cost in terms of tax complexity because the AMT essentially requires taxpayers to perform additional calculations under a second tax system parallel to the regular income tax.

Today, tax statistics show the AMT is unneeded because higher-income families pay a very high average tax burden even before AMT is considered. IRS figures show that in 1997 families with incomes over \$200,000 (who represent just 1.5 percent of tax filing families) paid 37.1 percent of all income taxes before AMT. The AMT only very slightly increased the tax share of these families to 37.3 percent. But this slight increase in burden creates high complexity costs for taxpayers, and high administrative expenses for the IRS. The IRS National Taxpayer Advocate and other tax experts recommend that this unnecessary tax be repealed, or at least reformed.³⁹

While the tax was originally aimed only at high-income Americans, flaws in its design mean that rising numbers of middle-income taxpayers must also deal with the AMT. In particular, AMT exemption amounts, phase-out thresholds, and the top tax rate threshold are not indexed for inflation, so as incomes grow more families become subject to this tax. Even if they do not owe AMT, more and more taxpayers must perform calculations to see if they are liable for it, above and beyond their regular tax amount. Taxpayers hit

percent of their family's expenses for health insurance; this will rise to 100 percent in 2003.

³⁹Internal Revenue Service, National Taxpayer Advocate, *Annual Report to Congress FY 1999*.

by this add-on tax are projected to jump from about 1 million today to about 9 million by 2009.⁴⁰

Repeal the Social Security earnings test. Americans in their sixties are increasingly healthy and energetic and not ready for retirement. Unfortunately, current Social Security rules discourage them from continuing to work. The minimum age to begin receiving Social Security retirement benefits is 62. The Social Security “earnings test” reduces benefits for retirees age 62 to 69 who have earnings from work above fairly low earnings thresholds. While these rules are not part of the tax system, they effectively act like a high marginal tax rate on work effort for retirees. The earnings test should be repealed to eliminate this perverse incentive that discriminates against the industrious elderly.

In 2000, individuals age 62 to 64 lose \$1 of benefits for every \$2 they earn above \$10,080 a year. Those aged 65 to 69 lose \$1 of benefits for every \$3 they earn above \$17,000 a year. Like other workers, older workers are also subject to payroll and income taxes on earnings.

The combined effect of lost Social Security benefits plus payroll and income taxes means that, above the threshold, persons age 65 to 69 keep only \$41 for every \$100 they earn if they have decided to take Social Security benefits during those years. This effectively creates a marginal tax rate of 59 percent.⁴¹ Such high marginal tax rates are hard to justify. The economy suffers because it is deprived of the knowledge and skills of productive workers. The elderly are harmed because the law discourages them from providing for themselves and as a result they become more dependent on government.

Today, most Social Security recipients do not work. But many would like to, and this policy discourages them from doing so. As the health of older Americans continues to improve, the harmful side effects of the current Social Security earnings test will worsen. As we write this, a bill to remove the earnings test for persons 65 and older (H.R. 5) has passed the House of Representatives and the Senate. However, the bill would not remove the earnings test for persons under age 65.

⁴⁰U.S. Congress, Joint Committee on Taxation, report JCX-39-99, June 22, 1999.

⁴¹Suppose that a Social Security recipient age 65 to 69 earns an additional \$107.65 in pre-tax wages above the earnings threshold. Payroll taxes take \$15.30, income taxes are \$15 in the 15 percent bracket, and Social Security benefits are reduced \$33.33. The effective, combined marginal rate is $\$63.33 \div \$107.65 = 0.59$, or 59 percent.

7. ECONOMICS, TRADE DEFICITS, AND PAYING OFF THE NATIONAL DEBT

Sound economic policy requires sound thinking. Two issues that are currently attracting considerable attention are trade deficits and the possible elimination of the federal government's public debt. Economic analysis provides considerable insight into both issues.

I. Is the Trade Deficit a Problem?

During the last 25 years, the United States has persistently run large trade deficits. There is a natural tendency to believe that a trade deficit is bad for an economy. This is understandable: the word "deficit" suggests things like excessive spending relative to income, bank overdrafts, indebtedness, and a future day of reckoning. A trade deficit, however, is not like this. A trade deficit occurs when a nation's imports exceed its exports. Many times, this occurs because a nation is growing more rapidly than its trading partners. Rapid domestic growth stimulates imports, while slow growth abroad weakens demand for a nation's exports. This combination often causes a trade deficit.

Trade deficits may also occur when investment opportunities at home are attractive relative to those available abroad. Trade deficits are the flip side of net inflows of capital. With floating exchange rates, market forces will bring American purchases of goods, services, and assets from foreigners into balance with sales of these items to foreigners. This means that

$$\text{Exports} + \text{Net Foreign Investment} = \text{Imports}^{42}$$

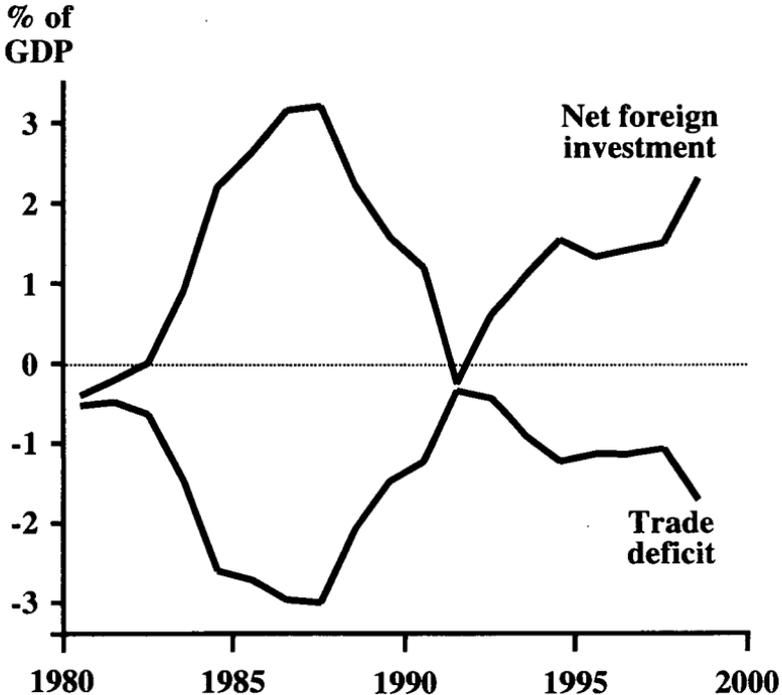
Therefore, when foreigners invest heavily in a country--when there is the net inflow of capital--a trade deficit (current-account deficit) will occur.

During the last two decades, the United States has grown faster than many of its trading partners. At the same time, investment opportunities have been highly attractive in the United States. This combination has undergirded the trade deficits of the last two decades. Why do many people think the trade deficits are bad? Would we have been better off if the U.S. had grown more slowly or if the environment for investment in the United States had been less attractive? These

⁴²This formula omits investment income and unilateral transfers, which are small in the case of the United States.

Exhibit 14: Relationship Between the Trade Deficit and Net Foreign Investment

Net foreign investment (NFI) and the trade deficit are closely linked. When NFI changes, so does the trade deficit.



Sources: *Economic Report of the President*, 2000, table b-22; Haver Analytics.

Note: For underlying data, see Appendix, table 7.

questions answer themselves. Recent trade deficits reflect the strength of the U.S. economy, not its weakness.

Exhibit 14 illustrates that net foreign investment (net inflow of capital) and the trade deficit are almost mirror images. When net foreign investment increases, the demand for the dollar rises in the foreign exchange market, causing it to appreciate. In turn, the appreciation of the dollar stimulates imports relative to exports, causing a trade deficit. Just the opposite happens when there is an outflow of capital: the dollar depreciates, exports are stimulated relative to imports, and the trade balance shifts toward a surplus.

Doesn't a trade deficit mean greater indebtedness to foreigners? Not necessarily. Much of the foreign investment involves the purchase of stocks and physical assets like buildings and business assets.

Americans benefit because they are able to sell these assets to foreigners at more attractive prices than would otherwise be possible. Foreign investments of this type do not increase American indebtedness to foreigners. Some foreign investments are in the form of loans or the purchase of bonds, which mean lower interest rates for Americans. If the investments are sound, they will generate a future income stream that is more than sufficient to repay the loans. Even in this case, the loans are helpful to the U.S. economy.

Critics of trade often argue that trade deficits mean loss of jobs. Once the link between the inflow of capital and trade deficits is recognized, the error of this view is obvious. The inflow of capital that must accompany a trade deficit will lead to lower interest rates and a higher level of investment. Any loss of jobs accompanying the excess of the imports relative to exports will be offset by higher employment due to the lower interest rates and more investment. The U.S. experience during the Great Expansion illustrates this. Even though imports grew more rapidly than exports and trade deficits were sizeable throughout much of the period, total employment increased by 35 million from 1983 to 1999 and the unemployment rate fell to a 30-year low (see Exhibits 1 and 3 above). Simply put, the protectionist view that trade deficits reduce employment is fallacious. Neither economic theory nor empirical evidence provides support for this position.

Can a country continue to run trade deficits? Perhaps surprisingly, the answer is "yes." Remember that trade deficits reflect the net inflow of capital. The inflow can and will continue as long as investors find the U.S. economy more attractive than other economies. Put another way, foreigners will be happy to supply investment capital to the U.S. economy as long as they can earn competitive returns. In the case of debt financing, as long as the net income generated by the investment is large enough to cover the borrowing costs, there is no reason why the process cannot continue indefinitely. The historical evidence is consistent with this view. The U.S. experienced trade deficits and capital inflows year after year from 1820 to 1870. During that period, investment opportunities in the New World were more attractive than those in Europe, so Europeans were quite willing to continue financing undertakings in the New World.

A trade deficit is quite different from a business loss or even the budget deficit of a government. No legal entity is responsible for the trade deficit.⁴³ It is not something that one party owes to another; it is

⁴³ In his typical satirical manner, the late Herbert Stein put it this way: "The trade deficit does not belong to any individual or institution. It is a pure statistical aggregate, like the number of eggs laid in the U.S. or the number of bald-headed men living here." Herbert Stein, "Leave the Trade Deficit Alone," *Wall Street Journal*, March 11, 1987.

merely the sum of the buying and selling decisions of millions of people. Suppose an American retailer purchases \$500,000 of shoes from a British manufacturer. In turn, the British firm uses the funds to buy stocks or bonds issued by an American corporation. These transactions will increase the size of the trade deficit. But why is there any reason for concern? They reflect the voluntary choices of individuals that will both reap the benefits and bear the costs. This is also true for a nation's trade deficit.

II. Should the Federal Debt Be Fully Paid Off?

At the end of 1999, the federal debt was \$5.7 trillion. Of this amount, \$2.2 trillion was held by federal agencies and trust funds (primarily the Social Security Administration) and another \$500 billion was held by Federal Reserve Banks. Thus, the amount of debt that the federal government owes to someone other than itself is only \$3 trillion.

Eliminating or at least greatly reducing the federal debt has become a generally accepted goal across the political spectrum. The attractiveness of paying off the national debt is certainly understandable. However, there are also reasons to exercise caution.

There is an "optimal amount of debt" for both businesses and governments. Just as the optimal amount is often positive for a strong healthy business, it may also be positive for the federal government. There are several reasons why the optimal federal debt is unlikely to be zero. First, U.S. Treasury securities play an important role in our financial markets. Treasury securities, particularly those that are indexed for inflation, provide households, businesses, pension funds, and financial institutions with a secure, highly liquid asset that makes it easier for them to deal with an uncertain future. The interest rate on these securities also provides a benchmark for the evaluation of other, riskier assets. Furthermore, if the federal government repays the debt by levying higher taxes than would otherwise exist, private households and businesses will have to borrow more than would otherwise be the case. In essence, this substitutes riskier, high-interest debt for more secure, low-interest debt. On balance, it is not obvious that the substitution will reduce overall interest costs.

Second, the Federal Reserve manages the money supply through the purchase and sale of U.S. securities in the open market. If Treasury securities were unavailable, the Fed would have to buy and sell a large amount of securities issued by private firms, which would give the Fed an opportunity to play favorites and subject the Fed to political pressure regarding the companies whose securities it purchases.

Third, the U.S. dollar is a "reserve currency." Central banks and other monetary authorities around the globe currently hold more than \$600 billion of U.S. Treasury securities as reserve assets. If the national debt was paid off and the securities were unavailable to foreigners, the dollar would be less attractive as a worldwide currency. With time, the reduction in the worldwide demand for the dollar could erode its position as the world's leading currency and make financial markets in dollars less extensive. That might make it more costly for Americans to engage in international transactions.

Finally, we must not forget that the national debt is a relatively small portion of the federal government's unfunded liabilities. Currently, the unfunded liabilities of the Social Security system are estimated to be between \$5 trillion and \$11 trillion; those of the Medicare program are projected at almost \$10 trillion. These liabilities are far greater than the outstanding federal debt. Thus, restructuring these two programs in a manner that will both improve their performance and solvency is far more important to the future of American taxpayers than paying off the debt.

8. CONCLUSION

During the last two decades, the United States has been prosperous because we have had relatively open markets, monetary policy has focused on price stability, and federal government spending has fallen modestly as a share of GDP. This prescription has worked around the world. If the United States continues to adopt sound policies consistent with strong growth, the Great Expansion can continue. In this regard, the following are important.

Social Security, health care, and education

- Adopt Social Security reforms that would allow individuals to channel a portion of their payroll tax into Personal Savings Accounts. Begin moving the system from the pay-as-you-go approach to a personal savings and investment approach.
- Reform Medicare by placing greater reliance on Medical Savings Accounts and less reliance on third-party payments. This would increase incentives for consumers and suppliers to economize.
- Expand choice in education and make it possible for parents, particularly those with low incomes, to escape failing schools and choose the schools most suitable for their children.

Trade

- Avoid giving the World Trade Organization (WTO) responsibility for environmental and labor standards, which are already handled by other organizations and would dilute the WTO's focus.
- Expand the North American Free Trade Agreement (NAFTA) and other initiatives designed to promote open markets and free trade.
- Consider a unilateral phase-out of U.S. quotas and tariffs over 10 to 15 years.

Domestic and international monetary policy

- Continue to focus the Federal Reserve on price stability. Establish price stability by law as the main long-term goal of the Federal Reserve.
- Encourage official dollarization in interested countries.
- Encourage countries to adopt fixed exchange rates (as dollarization would provide) or fluctuating rates, and avoid pegged rates, which have been at the center of many currency crises.
- Reform the International Monetary Fund, using as a basis some of the recommendations of the International Financial Advisory Commission appointed by the Congress.

Taxes

- Reduce or eliminate the marriage penalty.
 - Make health insurance fully deductible for individuals so that direct purchase of health insurance is on an equal footing with purchase through an employer.
 - Repeal the Alternative Minimum Tax, which imposes a high burden of paperwork and generates little additional revenue.
 - Repeal the Social Security earnings test, as Congress has recently done for persons age 65 to 69, but not persons age 62 to 64.
 - End multiple taxation that discourages savings and investment, such as the double taxation of corporate profits.
 - Shorten depreciation periods to reflect the rapid pace of technological change in an increasing number of industries.
 - Resist big new spending initiatives that will obligate taxpayers for large sums in the future.
-

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This staff report reflects the views of the authors only. These views do not necessarily reflect those of the Joint Economic Committee, its Chairman, Vice Chairman, or any of its Members.

Table 1: Real Federal Spending per Person

Year	Federal government spending (FY) ----- Billions of current dollars -----			GDP deflator 1999=100	Current population millions
	Total	Defense	Non-defense		
1960	92.2	48.1	44.1	21.5	180.6
1961	97.7	49.6	48.1	21.7	183.6
1962	106.8	52.3	54.5	22.0	186.5
1963	111.3	53.4	57.9	22.2	189.2
1964	118.5	54.8	63.8	22.6	191.8
1965	118.2	50.6	67.6	23.0	194.2
1966	134.5	58.1	76.4	23.5	196.5
1967	157.5	71.4	86.0	24.3	198.7
1968	178.1	81.9	96.2	25.2	200.7
1969	183.6	82.5	101.1	26.4	202.6
1970	195.6	81.7	114.0	27.8	205.0
1971	210.2	78.9	131.3	29.3	207.6
1972	230.7	79.2	151.5	30.6	209.8
1973	245.7	76.7	169.0	32.2	211.9
1974	269.4	79.3	190.0	34.7	213.8
1975	332.3	86.5	245.8	38.1	215.9
1976	371.8	89.6	282.2	40.6	218.0
1977	409.2	97.2	312.0	43.1	220.2
1978	458.7	104.5	354.3	46.1	222.5
1979	504.0	116.3	387.7	49.7	225.0
1980	590.9	134.0	457.0	54.0	227.6
1981	678.2	157.5	520.7	59.1	229.9
1982	745.8	185.3	560.4	63.2	232.1
1983	808.4	209.9	598.5	66.0	234.2
1984	851.9	227.4	624.5	68.5	236.3
1985	946.4	252.7	693.7	70.7	238.4
1986	990.5	273.4	717.1	72.4	240.6
1987	1,004.1	282.0	722.1	74.3	242.8
1988	1,064.5	290.4	774.1	76.7	245.0
1989	1,143.7	303.6	840.1	79.7	247.3
1990	1,253.2	299.3	953.8	82.7	249.9
1991	1,324.4	273.3	1,051.1	85.8	252.6
1992	1,381.7	298.4	1,083.3	87.7	255.3
1993	1,409.4	291.1	1,118.3	90.0	258.0
1994	1,461.7	281.6	1,180.1	92.0	260.5
1995	1,515.7	272.1	1,243.7	94.0	263.0
1996	1,560.5	265.8	1,294.8	95.8	265.4
1997	1,601.2	270.5	1,330.7	97.4	267.9
1998	1,652.6	268.5	1,384.1	98.7	270.5
1999	1,703.0	274.9	1,428.2	100.0	273.1

Sources: Haver Analytics; *Economic Report of the President*, 2000, tables b-1, b-3, b-80, and b-82.

Note: FY = fiscal year.

Real Federal Spending per Person *(continued)*

Year	Federal government spending (FY)			Federal government spending (FY)		
	----- Billions of 1999 dollars -----			----- Per person in 1999 dollars -----		
	Total	Defense	Non-defense	Total	Defense	Non-defense
1960	429.7	224.4	205.4	2,379	1,242	1,137
1961	450.3	228.5	221.7	2,452	1,245	1,208
1962	485.7	238.0	247.7	2,605	1,276	1,328
1963	500.7	240.2	260.5	2,647	1,270	1,377
1964	525.4	242.7	282.7	2,739	1,265	1,474
1965	515.1	220.5	294.5	2,652	1,135	1,516
1966	571.7	247.0	324.8	2,909	1,257	1,653
1967	648.8	294.2	354.5	3,266	1,481	1,785
1968	705.7	324.6	381.1	3,517	1,617	1,899
1969	694.9	312.2	382.7	3,429	1,540	1,889
1970	703.0	293.5	409.5	3,430	1,432	1,998
1971	717.2	269.2	448.1	3,455	1,297	2,159
1972	753.4	258.6	494.8	3,590	1,232	2,358
1973	763.6	238.3	525.3	3,604	1,125	2,479
1974	776.0	228.6	547.4	3,630	1,069	2,560
1975	871.5	226.9	644.6	4,037	1,051	2,986
1976	916.0	220.8	695.2	4,202	1,013	3,189
1977	948.5	225.4	723.1	4,307	1,024	3,284
1978	995.8	226.8	768.9	4,475	1,019	3,456
1979	1014.8	234.2	780.6	4,510	1,041	3,469
1980	1095.2	248.3	846.9	4,811	1,091	3,720
1981	1147.0	266.4	880.6	4,989	1,159	3,830
1982	1180.1	293.2	886.9	5,084	1,263	3,821
1983	1224.8	318.0	906.7	5,229	1,358	3,871
1984	1244.1	332.1	912.0	5,265	1,405	3,859
1985	1338.5	357.5	981.1	5,614	1,499	4,115
1986	1368.2	377.6	990.6	5,687	1,570	4,117
1987	1351.4	379.5	971.8	5,567	1,563	4,003
1988	1387.9	378.6	1009.3	5,665	1,545	4,120
1989	1435.5	381.0	1054.5	5,805	1,541	4,264
1990	1515.3	361.9	1153.3	6,064	1,449	4,616
1991	1544.3	318.7	1225.6	6,114	1,262	4,853
1992	1574.8	340.1	1234.8	6,169	1,332	4,837
1993	1566.6	323.5	1243.1	6,072	1,254	4,818
1994	1588.4	306.0	1282.4	6,097	1,175	4,922
1995	1613.0	289.5	1323.5	6,134	1,101	5,033
1996	1629.2	277.4	1351.7	6,138	1,045	5,093
1997	1643.8	277.7	1366.1	6,135	1,036	5,098
1998	1674.9	272.1	1402.9	6,192	1,006	5,186
1999	1703.0	274.9	1428.2	6,236	1,006	5,229

Table 2: Civilian Labor Force

Year	----- millions -----			--- share of total ---	
	age 16-34	age 35-54	Total	age 16-34	age 35-54
1960	25.9	31.1	69.6	37.2%	44.7%
1961	26.2	31.5	70.5	37.2%	44.7%
1962	26.0	31.7	70.6	36.8%	44.9%
1963	26.7	32.1	71.8	37.1%	44.7%
1964	27.4	32.4	73.1	37.5%	44.3%
1965	28.4	32.6	74.5	38.1%	43.8%
1966	29.4	32.7	75.8	38.8%	43.2%
1967	30.6	32.9	77.3	39.5%	42.5%
1968	31.6	33.0	78.7	40.2%	41.9%
1969	33.2	33.2	80.7	41.1%	41.1%
1970	34.9	33.4	82.8	42.1%	40.3%
1971	36.5	33.3	84.4	43.3%	39.5%
1972	39.1	33.4	87.0	45.0%	38.3%
1973	41.7	33.5	89.4	46.7%	37.4%
1974	43.8	33.9	92.0	47.7%	36.9%
1975	45.5	34.0	93.8	48.5%	36.2%
1976	47.5	34.3	96.2	49.4%	35.7%
1977	49.7	34.8	99.0	50.2%	35.2%
1978	51.7	35.7	102.3	50.6%	34.9%
1979	53.3	36.6	105.0	50.8%	34.9%
1980	54.5	37.4	106.9	51.0%	34.9%
1981	55.5	38.2	108.7	51.1%	35.1%
1982	55.8	39.3	110.2	50.6%	35.7%
1983	56.1	40.5	111.6	50.3%	36.3%
1984	56.7	41.9	113.5	49.9%	36.9%
1985	57.2	43.4	115.5	49.5%	37.6%
1986	58.0	45.0	117.8	49.2%	38.2%
1987	58.2	46.7	119.9	48.6%	38.9%
1988	58.0	48.5	121.7	47.7%	39.9%
1989	58.0	50.5	123.8	46.8%	40.8%
1990	58.4	52.4	125.8	46.4%	41.6%
1991	57.3	54.1	126.3	45.4%	42.9%
1992	57.0	56.1	128.1	44.5%	43.8%
1993	56.3	57.9	129.2	43.6%	44.8%
1994	56.0	59.5	131.1	42.7%	45.4%
1995	55.7	61.0	132.3	42.1%	46.1%
1996	55.0	63.0	133.9	41.1%	47.0%
1997	54.8	64.9	136.3	40.2%	47.6%
1998	54.7	65.9	137.7	39.7%	47.9%
1999	54.4	67.3	139.4	39.0%	48.3%

Source: Haver Analytics.

Table 3: National Health Care Expenditures (NHE)

Year	----- Billions of dollars -----				----- Share of NHE -----		
	Total NHE	Out-of- pocket payments	Private health insurance	Public funds	Out-of- pocket payments	Private health insurance	Public funds
1960	26.9	13.1	5.9	6.6	48.7%	21.9%	24.8%
1961	28.8	13.4	6.6	7.3	46.5%	23.1%	25.4%
1962	31.3	14.2	7.4	8.0	45.5%	23.6%	25.5%
1963	34.1	15.5	8.0	8.7	45.6%	23.5%	25.6%
1964	37.6	17.3	8.9	9.4	45.8%	23.8%	24.9%
1965	41.1	18.5	10.0	10.3	45.1%	24.4%	25.0%
1966	45.3	18.8	10.3	13.7	41.6%	22.9%	30.2%
1967	51.0	18.8	10.7	19.0	36.9%	20.9%	37.3%
1968	57.7	20.8	12.2	21.8	36.0%	21.1%	37.8%
1969	64.8	22.7	13.8	24.5	35.1%	21.4%	37.9%
1970	73.2	24.9	16.3	27.7	34.0%	22.2%	37.8%
1971	81.0	26.4	18.6	31.2	32.6%	22.9%	38.5%
1972	90.9	29.0	21.3	35.1	31.9%	23.4%	38.6%
1973	100.8	32.0	23.9	39.3	31.7%	23.7%	39.0%
1974	114.3	34.8	26.8	46.6	30.5%	23.5%	40.8%
1975	130.7	38.1	31.3	55.0	29.1%	23.9%	42.1%
1976	149.9	41.9	37.9	62.4	28.0%	25.3%	41.7%
1977	170.4	46.4	45.9	70.2	27.2%	26.9%	41.2%
1978	190.6	49.7	52.5	79.6	26.1%	27.6%	41.7%
1979	215.2	54.3	60.9	90.1	25.2%	28.3%	41.9%
1980	247.3	60.3	69.8	104.8	24.4%	28.2%	42.4%
1981	286.9	68.5	82.2	121.2	23.9%	28.6%	42.2%
1982	323.0	75.4	95.4	134.6	23.4%	29.5%	41.7%
1983	355.3	82.3	106.2	147.5	23.2%	29.9%	41.5%
1984	390.1	90.9	119.2	160.1	23.3%	30.6%	41.1%
1985	428.7	100.7	132.8	174.2	23.5%	31.0%	40.6%
1986	461.2	108.1	140.6	189.8	23.4%	30.5%	41.2%
1987	500.5	116.1	152.4	207.2	23.2%	30.5%	41.4%
1988	560.4	127.5	178.1	226.1	22.7%	31.8%	40.4%
1989	623.5	133.2	208.5	252.1	21.4%	33.4%	40.4%
1990	699.4	145.0	239.6	283.2	20.7%	34.3%	40.5%
1991	766.8	153.3	261.7	317.9	20.0%	34.1%	41.5%
1992	836.5	161.8	285.5	353.0	19.3%	34.1%	42.2%
1993	898.5	167.1	306.8	385.3	18.6%	34.1%	42.9%
1994	947.7	168.5	315.1	422.8	17.8%	33.2%	44.6%
1995	993.7	171.0	324.3	455.2	17.2%	32.6%	45.8%
1996	1,042.5	178.1	337.1	481.4	17.1%	32.3%	46.2%
1997	1,092.4	187.6	348.0	507.1	17.2%	31.9%	46.4%

Source: Health Care Financing Administration Web site, <http://www.hcfa.gov>.

Note: There remains a small portion of third-party financing, comprised principally of charitable contributions.

Table 4: Health Care Price Indexes

Year	CPI (1966=100)	--- Raw index ----		--- Index relative to CPI ---	
		Medical care	Drugs and supplies	Medical care	Drugs and supplies
1966	100.0	100.0	100.0	100.0	100.0
1967	103.1	107.2	98.1	104.0	95.2
1968	107.4	113.7	96.4	105.8	89.8
1969	113.3	121.3	97.7	107.1	86.2
1970	119.8	129.3	99.4	108.0	83.0
1971	125.0	137.3	99.4	109.8	79.5
1972	129.0	141.8	99.0	109.9	76.7
1973	137.0	147.5	98.7	107.7	72.1
1974	152.2	161.2	101.0	106.0	66.4
1975	166.0	180.6	107.3	108.8	64.6
1976	175.6	197.7	113.0	112.6	64.3
1977	187.0	216.7	119.9	115.9	64.1
1978	201.2	235.0	129.1	116.8	64.2
1979	224.1	256.7	139.2	114.5	62.1
1980	254.3	284.8	152.0	112.0	59.8
1981	280.6	315.2	169.4	112.4	60.4
1982	297.8	351.7	189.1	118.1	63.5
1983	307.4	382.5	209.9	124.4	68.3
1984	320.7	406.1	230.0	126.6	71.7
1985	332.1	431.6	251.8	129.9	75.8
1986	338.3	463.9	273.4	137.1	80.8
1987	350.6	494.7	295.2	141.1	84.2
1988	365.1	527.0	318.7	144.3	87.3
1989	382.7	567.7	346.3	148.3	90.5
1990	403.4	619.0	380.9	153.5	94.4
1991	420.4	673.0	418.7	160.1	99.6
1992	433.0	722.8	450.1	166.9	103.9
1993	446.0	765.8	467.5	171.7	104.8
1994	457.4	802.3	483.4	175.4	105.7
1995	470.4	838.4	492.7	178.2	104.7
1996	484.3	867.7	509.2	179.2	105.2
1997	495.4	892.0	522.6	180.1	105.5

Source: Haver Analytics.

**Table 5: Real Education Spending
and Student Performance**

End of school year	Public school K-12 students (millions)	Total government expenditures for elementary and secondary education			Avg SAT of students entering college
		<i>Billions of</i>		<i>1999 \$ per pupil</i>	
		<i>current \$</i>	<i>1999 \$</i>		
1970	51.3	28.4	122.0	\$2,381	1049
1971	51.3	33.1	136.2	\$2,657	1045
1972	50.7	35.4	141.2	\$2,783	1039
1973	50.4	40.9	153.6	\$3,044	1029
1974	50.1	44.6	150.8	\$3,012	1026
1975	49.8	48.2	149.3	\$2,998	1010
1976	49.5	52.0	152.3	\$3,079	1006
1977	48.7	57.1	157.1	\$3,224	1003
1978	47.6	61.7	157.8	\$3,312	1001
1979	46.7	70.4	161.6	\$3,464	998
1980	46.2	72.8	147.3	\$3,187	994
1981	45.5	81.0	148.5	\$3,262	994
1982	45.2	86.8	149.9	\$3,320	997
1983	45.0	95.7	160.2	\$3,562	997
1984	44.9	103.2	165.6	\$3,687	1001
1985	45.0	112.1	173.7	\$3,861	1009
1986	45.2	118.1	179.6	\$3,974	1009
1987	45.5	127.2	186.7	\$4,103	1008
1988	45.4	136.7	192.6	\$4,240	1006
1989	45.9	148.1	199.1	\$4,338	1006
1990	46.4	160.4	204.6	\$4,405	1001
1991	47.2	172.2	210.8	\$4,461	999
1992	48.2	192.5	228.7	\$4,745	1001
1993	48.9	207.4	239.3	\$4,889	1003
1994	49.7	223.6	251.5	\$5,060	1003
1995	50.5	234.7	256.7	\$5,080	1010
1996	51.4	246.0	261.4	\$5,087	1013

Sources: Dept. of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1998 and earlier editions; College Board Web site, <http://www.collegeboard.org>; Haver Analytics.

Table 6: Trade Openness Index (average 1980-97)

Country	Index	Country	Index
1 Hong Kong	9.9	50 Kenya	5.0
2 Singapore	9.8	51 Tunisia	5.0
3 Belgium	9.0	52 Cote d'Ivoire	5.0
4 Panama	8.8	53 Gabon	4.9
5 Luxembourg	8.5	54 Paraguay	4.9
6 Germany	8.5	55 China	4.8
7 United Kingdom	8.4	56 Sri Lanka	4.8
8 United States	8.4	57 Dem Rep of the Congo	4.8
9 Netherlands	8.4	58 Ecuador	4.7
10 Switzerland	8.1	59 Zambia	4.6
11 Malaysia	7.9	60 Turkey	4.6
12 Canada	7.7	61 Cyprus	4.6
13 Sweden	7.7	62 Cameroon	4.6
14 Ireland	7.5	63 Hungary	4.5
15 Norway	7.4	64 Colombia	4.5
16 New Zealand	7.4	65 Honduras	4.4
17 Italy	7.3	66 Belize	4.4
18 Taiwan	7.1	67 Zimbabwe	4.4
19 Spain	7.1	68 Guatemala	4.3
20 Australia	7.1	69 Senegal	4.3
21 Denmark	7.1	70 Barbados	4.2
22 Uruguay	6.9	71 Malawi	4.2
23 Austria	6.9	72 Niger	4.2
24 Portugal	6.7	73 Peru	4.2
25 Finland	6.5	74 Dominican Republic	4.1
26 Venezuela	6.5	75 Central African Republic	4.0
27 Thailand	6.4	76 Trinidad & Tobago	4.0
28 Japan	6.4	77 Bahamas	3.8
29 South Korea	6.4	78 El Salvador	3.7
30 France	6.3	79 Pakistan	3.7
31 Chile	6.2	80 Egypt	3.7
32 South Africa	6.2	81 Nepal	3.6
33 Jordan	6.2	82 Nicaragua	3.4
34 Israel	6.1	83 India	3.3
35 Indonesia	6.0	84 Brazil	3.3
36 Botswana	6.0	85 Tanzania	3.1
37 Philippines	6.0	86 Algeria	3.0
38 Fiji	5.9	87 Madagascar	3.0
39 Rep of the Congo	5.7	88 Nigeria	2.9
40 Bolivia	5.5	89 Argentina	2.8
41 Greece	5.5	90 Ghana	2.8
42 Jamaica	5.5	91 Syria	2.4
43 Malta	5.4	92 Uganda	2.4
44 Mali	5.4	93 Iran	2.0
45 Iceland	5.3	94 Burundi	1.4
46 Mexico	5.3	95 Sierra Leone	1.4
47 Morocco	5.3	96 Bangladesh	0.6
48 Costa Rica	5.1	97 Myanmar	0.2
49 Mauritius	5.0		

Source: Constructed by the staff of the Joint Economic Committee.

Table 7: Individual Income Tax Shares

<i>Federal income tax share by percentiles</i>					
Year	Top 1%	Top 5%	Top 10%	Next 40%	Bottom 50%
1980	19.1%	36.8%	49.3%	43.7%	7.0%
1981	17.6%	35.1%	48.0%	44.6%	7.5%
1982	19.0%	36.1%	48.6%	44.1%	7.3%
1983	20.3%	37.3%	49.7%	43.1%	7.2%
1984	21.1%	38.0%	50.6%	42.1%	7.4%
1985	21.8%	38.8%	51.5%	41.4%	7.2%
1986	25.7%	42.6%	54.7%	38.9%	6.5%
1987	24.8%	43.3%	55.6%	38.3%	6.1%
1988	27.6%	45.6%	57.3%	37.0%	5.7%
1989	25.2%	43.9%	55.8%	38.4%	5.8%
1990	25.1%	43.6%	55.4%	38.8%	5.8%
1991	24.8%	43.4%	55.8%	38.7%	5.5%
1992	27.5%	45.9%	58.0%	36.9%	5.1%
1993	29.0%	47.4%	59.2%	36.0%	4.8%
1994	28.9%	47.5%	59.4%	35.8%	4.8%
1995	30.3%	48.9%	60.7%	34.6%	4.6%
1996	32.3%	51.0%	62.5%	33.2%	4.3%
1997	33.2%	51.9%	63.2%	32.5%	4.3%

Source: Internal Revenue Service.

Table 8: Trade Deficit and Net Foreign Investment

Year	GDP	Trade deficit	Net foreign investment	Trade deficit	Net foreign investment
	----- billions of dollars -----			---- as a share of GDP ----	
1980	2795.6	-14.9	11.4	-0.5%	0.4%
1981	3131.4	-15.0	6.3	-0.5%	0.2%
1982	3259.2	-20.6	-0.2	-0.6%	0.0%
1983	3535.0	-51.7	-32.0	-1.5%	-0.9%
1984	3932.8	-102.0	-87.0	-2.6%	-2.2%
1985	4213.0	-114.2	-110.9	-2.7%	-2.6%
1986	4452.9	-131.9	-140.6	-3.0%	-3.2%
1987	4742.5	-142.3	-152.0	-3.0%	-3.2%
1988	5108.3	-106.3	-113.2	-2.1%	-2.2%
1989	5489.1	-80.7	-86.7	-1.5%	-1.6%
1990	5803.3	-71.5	-69.2	-1.2%	-1.2%
1991	5986.2	-20.7	14.9	-0.3%	0.2%
1992	6319.0	-27.8	-38.7	-0.4%	-0.6%
1993	6642.3	-60.5	-72.9	-0.9%	-1.1%
1994	7054.3	-87.1	-108.3	-1.2%	-1.5%
1995	7400.6	-84.3	-98.0	-1.1%	-1.3%
1996	7813.2	-89.0	-110.7	-1.1%	-1.4%
1997	8300.7	-88.3	-123.7	-1.1%	-1.5%
1998	8760.0	-149.55	-201.5	-1.7%	-2.3%

Source: Haver Analytics; *Economic Report of the President*, 2000, table b-22.

**Entrepreneurial
Dynamism and
the Success of U.S.
High-Tech**

October 1999

**Joint Economic Committee
Office of the Chairman,
Senator Connie Mack**

EXECUTIVE SUMMARY

U.S. Expansion Led by the High-Tech Sector. America's robust economic expansion is being led by the high-tech sector, which is currently generating over one-third of real economic growth. World-leading U.S. high-tech industries highlight the gap between America's dynamic economy and slower-growing Europe and Japan.

U.S. High-Tech Success. No top-down or strategic plan was responsible for the success of U.S. high-tech industries such as semiconductors, software, and biotechnology. Rather, open markets and decentralized sources of financing have allowed entrepreneurs to pursue diverse innovative approaches.

Entrepreneurs and Growth. The explosion of high-tech business start-ups and their rapid expansion in recent years emphasizes the importance of entrepreneurship to economic growth. Studies have found that the United States has the highest level of entrepreneurship among major nations, and that high levels of entrepreneurship are correlated with higher economic growth rates across countries.

Entrepreneurs Create Tomorrow's Jobs. About 10 percent of U.S. jobs disappear each year from layoffs and business failures. This high rate of job loss emphasizes the crucial role of entrepreneurs, who generate a constant stream of new businesses and jobs, provided that they have the incentives and opportunities to expand and innovate.

Efficient Use of Innovation Inputs. High levels of entrepreneurship and competition ensure that R&D, education, and investment capital are used to maximum advantage. Inventions don't generate economic growth until entrepreneurs gain financing, create businesses, and successfully compete in markets that are open to new ideas.

Financial Market Innovation. U.S. financial market innovations have supported the growth of young high-tech companies, which depend heavily on external funds to fuel expansion. U.S. capital markets have spawned efficient new public share issues, and a venture capital market about four times larger than Europe's. Additionally, a large supply of wealthy investors in the United States provides early funding to high-tech entrepreneurs in a decentralized "angel" market, thought to be about twice the size of the venture capital market.

High-Tech's Virtuous Circle. The U.S. high-tech sector has grown rapidly in a virtuous circle of wealth creation as successful entrepreneurs recycle their income and expertise back into new business start-ups. Policymakers can promote this virtuous circle by pursuing open trade and investment policies, deregulating product and financial markets, removing barriers to entrepreneurship, and lowering taxes on the returns to risky start-up financing.

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FOREWORD

The rapid growth of U.S. high-technology industries is giving added respect to the role played by entrepreneurs in our economy. Many high-tech entrepreneurs have created vast new businesses and thousands of new jobs in just a few years after starting out with nothing more than a good idea. In part, America's robust economic expansion is being led by entrepreneurial companies in software, semiconductors, biotechnology, and Internet-related industries. American companies are world leaders in these industries, and dominate global markets for many high-tech products and services.

This report—the third of the JEC series on economic growth—helps to explain the remarkable success of U.S. high-tech companies. It focuses on the role of open markets, innovative ideas, and entrepreneurship in the success of the U.S. high-tech sector. If economic policy continues to provide the proper environment, America's lead as the wealthiest and most technologically advanced nation will be maintained well into the next century.

**Senator Connie Mack, Chairman
Joint Economic Committee**

INTRODUCTION

America's robust economic expansion is being led by the high-technology sector, which is currently generating over one-third of real economic growth. High-tech industries now account for about 8.2 percent of U.S. gross domestic product, up from just 4.5 percent in 1980.¹

U.S. software, semiconductor, biotechnology, pharmaceutical, and Internet-related industries lead world markets. U.S. firms produce half of the world's semiconductors.² The U.S. biotechnology industry is about five times larger than Europe's.³ U.S. companies are expected to account for 80 percent of the world's top-selling pharmaceutical products by 2002.⁴ And the United States leads the world in Internet-related industries with 60 percent of all Internet host computers, and half of the world's Internet users.⁵

U.S. leadership in the high-tech sector highlights the gap between America's fast-growing and dynamic economy and the slow-growth economies of Europe and Japan during the 1990s. This economic gap can be measured by comparison of per-capita GDP figures. In 1998, the per-capita GDPs of the European Union and Japan were just 70 and 79 percent, respectively, of the U.S. figure.⁶ These income gaps show no signs of narrowing any time soon. As a result, some foreign governments are making reforms in an effort to "ape American business dynamism."⁷

What has the United States done right? Economists often explain economic expansions by pointing to factors such as consumer spending, exports, or other aggregate indicators. But to sustain economic growth over the long-term, more fundamental institutional factors must be considered.

These factors include entrepreneurship, open markets, and the diverse generation of ideas and innovations – all factors that have been conspicuous in the growth of U.S. high-tech. This report describes how

¹ *The Emerging Digital Economy II*, U.S. Department of Commerce, 1999.

² Semiconductor Industry Association Web page <www.semichips.org>.

³ "Biotechnology Spotlight," *OECD Observer*, March 1999.

⁴ "Pharmaceutical Groups Search for Quick Fix," *Financial Times*, September 13, 1999.

⁵ Internet host figures from Network Wizards/MIDs <www.ngi.org/trends>; Internet use figures from Computer Industry Almanac, Inc.

⁶ *OECD in Figures 1999 Edition*. Organization for Economic Cooperation and Development, 1999. Figures are based on purchasing power parities.

⁷ *Economist*, February 13, 1999.

these mutually reinforcing strengths have fueled high-tech growth, and have contributed to America's lead as the wealthiest and most technologically advanced nation. These strengths can be summarized as follows:

- **Entrepreneurship.** Entrepreneurs reorganize the economy by creating new companies and better products with lower costs. Their risk-taking actions shift people and resources from old uses to new and higher-valued uses. By doing so, entrepreneurs increase productivity and generate economic growth.

- **Open-Market Dynamism.** The benefits of entrepreneurship are maximized when markets are open to new business start-ups, new products, and new ways of working. The U.S. high-tech sector shows how rapid economic expansion can occur in a market which is relatively unregulated, is open to foreign trade and investment, has a flexible and mobile labor force, and is financed by efficient capital markets. These conditions have attracted many entrepreneurs to high-tech, and led to the creation of new opportunities for American workers.

- **Diversity.** Uncertainty about the future course of technology and the economy is pervasive. As a consequence, the best way to build tomorrow's successful industries is to allow entrepreneurs to pursue diverse business ideas. Diversity is an American strength. New ideas flow from its open culture, superior university system, immigration, and elsewhere. Ideas are turned into innovations in large corporations, swarms of start-up companies, and thousands of public and private research labs. Funding for innovation is also diverse with investment from thousands of venture capitalists, angel investors, and other sources of capital.

Entrepreneurship, open markets, and diversity have no doubt always played a central role in America's economic growth. But rapid shifts in technology and fast-changing markets in the new "knowledge economy" suggest that these institutional strengths are more important than ever.

Consider the enormous "churning" that occurs in jobs and businesses. About 10 percent of U.S. jobs disappear annually due to business closures and contractions.⁸ As a result, about 13 million new jobs must be created every year in order to maintain a healthy job market. These jobs are created in high-tech and other growth industries if entrepreneurs are given the open markets and incentives needed to expand and innovate.

⁸ "Gross Job Flows," Steven Davis and John Haltiwanger, in *Handbook of Labor Economics*, 1998.

The need to stimulate continual job creation in new industries suggests that federal policy focus on creating the best possible business environment for entrepreneurial high-tech companies. Not only do high-tech entrepreneurs create new jobs to replace those lost in shrinking industries, they serve to rapidly implement new scientific advances that flow from the nation's research labs. This latter role is crucial because innovation experts find that rapid and efficient exploitation of inventions may be just as important as their initial generation.⁹

High-tech policy should recognize that the benefits of education, research and development (R&D), and other high-tech investments are maximized when entrepreneurs have incentives to execute new business ideas efficiently in open markets. Regulation, taxation, trade, investment, and immigration policies can all affect the entrepreneurial dynamism that has kept America's high-tech industries in the lead.

In this report, Section 1 looks at the role of entrepreneurs and the incentives they face; Section 2 discusses why open markets are central to a growing, dynamic economy; Section 3 examines how a diversity of people and institutions contributes to America's high-tech success; and Section 4 presents the report's conclusions.

1. THE ENTREPRENEURIAL ECONOMY

A. The Times They Are A-Changin'

The rapid growth of many U.S. high-tech industries is giving new respect to the role played by entrepreneurs in the economy. Many high-tech entrepreneurs have created vast businesses and thousands of new jobs in just a few years after starting out with nothing more than a good idea. The Internet equipment company Cisco Systems is a good example. It was founded in the mid-1980s by a few university computer scientists with the idea of building devices to connect computers into large networks. Cisco, with sales of just \$69 million in 1990, has exploded into a worldwide business with sales of over \$8 billion and 19,000 employees by 1998.

Cisco exemplifies leading-edge innovation and growth in today's economy. By contrast, stable industrial giants were seen as the backbone of the economy during much of this century. Not only did automobile, steel, and other big corporations create large economies of

⁹ "The Global Environment of U.S. Science and Technology Policies," David C. Mowery in *Harnessing Science and Technology for America's Future*, National Research Council, 1999. p.84. --

scale, they were considered to be the dominant source of innovation. Economists such as John Kenneth Galbraith thought that large bureaucratic corporations carefully controlled both the nation's technological progress and consumer tastes. Meanwhile, governments believed that their task was to "manage" the economy by regulating the giant industrial corporations, and keeping full employment by skillfully guiding fiscal policy.

The "managed economy" consensus broke down during the stagflation of the 1970s. It turned out that the government's ability to fine-tune the macro-economy was a mirage. At the same time, big business stability was upset in industry after industry as scores of interlopers challenged seemingly unassailable firms such as AT&T and IBM. Upstart entrepreneurs have shaken up many once-stable industries such as steel, retailing, and financial services. Evidence indicates that economic activity since the 1970s has moved away from large corporations towards small and medium-size firms. The share of total U.S. employment represented by Fortune 500 firms has fallen from 20 percent in 1970 to just 8.5 percent by 1996.¹⁰

Many economists believe that industrial countries are undergoing a fundamental shift away from a "managed economy" towards an "entrepreneurial economy."¹¹ The cornerstones of the managed economy – stability, homogeneity, and economies of scale – are being replaced by greater turbulence, heterogeneity, and flexibility. These qualities of the new entrepreneurial economy can be seen in high-tech fields such as electronics, biotechnology, and the Internet.

Numerous forces are moving us towards a more entrepreneurial economy. First, the poor employment and growth performance of the overly "managed" economies in the world has caused policymakers to seek new approaches. Second, rising globalization is forcing companies everywhere to improve their competitiveness, and forcing governments to improve their business climates to attract the new growth industries. Third, established companies in every industry are being pressed by entrepreneurs embracing new technologies, such as flexible automation and the Internet, to challenge old ways of doing business.

Even the British Labor party has embraced the new entrepreneurial view. In a recent report, the Labor government noted the following:

¹⁰ "Linking Entrepreneurship to Economic Growth," Sander Wennekens and Roy Thurik in *Small Business Economics* 13, 1999.

¹¹ *Sources of Growth: The Entrepreneurial Versus the Managed Economy*, David Audretsch and Roy Thurik, with the Tinbergen Institute at Erasmus University Rotterdam, September 1997.

It is important to create the right environment for innovation and the exploitation of new ideas, with a supportive institutional and cultural framework. Macroeconomic stability is crucial. Property rights must be established and enforced, the banking and financial system should be capable of bearing risk, and society should respect, foster, and encourage enterprise. The capacity for growth is reduced in societies that are unwilling or unable to innovate and change.¹²

Pundits are changing their messages as well. In 1989, celebrated MIT economist Lester Thurow opined: "can economic command significantly...accelerate the growth process? The remarkable performance of the Soviet Union suggests it can...Today it is a country whose economic achievements bear comparison with those of the United States."¹³ In his new 1999 book, Thurow has changed his tune to reflect the new realities. He now thinks that "there are no institutional substitutes for individual entrepreneurial change agents."

B. Entrepreneurs and Economic Growth

1. The Outsider Entrepreneur. Many business stories illustrate the power that entrepreneurs exert in the new economy. In 1979, Steve Jobs toured a Xerox research facility and saw a computer with an experimental graphical user interface (GUI) - forerunner to today's Windows computer screen. Xerox had no big plans for the GUI, thus leaving the path open for Jobs to implement his vision with the revolutionary Apple Macintosh in the 1980s.¹⁴ Today, most of world's 360 million or so PC users turn on their computers to find a user-friendly interface descended from Apple's original innovation.

Often in U.S. high-tech history, outsider entrepreneurs have played such a "just do it" role, while large research labs have not capitalized on significant inventions. The distinction highlighted by economist Joseph Schumpeter between "invention" and "innovation" is important to keep in mind. Inventions create advances in knowledge, but they don't change the economy until they are implemented as an

¹² *Our Competitive Future: Building the Knowledge-Driven Economy*, U.K. Secretary of State for Trade and Industry, December 1998.

¹³ See Kevin Hassett, *American Enterprise*, September/October 1999.

¹⁴ "Poor Little Lisa," *Invention and Technology*, Summer 1999.

innovation. Innovations occur when an entrepreneur gathers the financing, creates the business structure, and injects an invention into the economy. To Schumpeter, economic progress is dependent on innovating entrepreneurs exploiting new ideas and changing the way the economy operates.

Entrepreneurs are needed because new ideas often need new outsider firms to implement them. The minicomputer market in the 1960s was spurred by outsider entrepreneurs at Digital Equipment Corporation and elsewhere. Similarly, the computer workstation market in the 1980s was created by Sun Microsystems, an outsider start-up firm. Some high-tech observers think that IBM had the patents, the scientists, and the R&D to create and hold onto these markets if they had had the foresight. But IBM was unable to adopt the new business perspectives needed for the changing times.¹⁵ It seems that in many cases it is entrepreneurs, not new technologies themselves, that create new high-tech markets and economic growth.

Existing businesses often fear “cannibalizing” their own sales, and so are reluctant to experiment with new products. IBM, for example, was slow to enter the mini and microcomputer markets partly because of fear of cannibalizing its mainframe computers.¹⁶ Because of this reluctance, the economy needs independent entrepreneurs in order to inject new ideas into the marketplace and to let consumers be the judge of new technologies.

Electronic commerce on the Internet provides many examples of independent entrepreneurs challenging established firms. In retail, established leaders, such as Toys R Us, face stiff competition from Web upstarts because they haven’t been willing to discount prices to undercut their “bricks and mortar” stores.¹⁷ One measure of the importance of independent entrepreneurs in the exploding Internet industry is that over half of the top 100 Web sites are run by Internet-only companies such as Amazon and Yahoo, and not by traditional bricks and mortar companies.¹⁸ *Washington Post* columnist Leslie Walker noted the following:

The only way to really know what consumers will do is to make them an offer and see how they will

¹⁵ “The IBM Failure,” *Upside Today*, February 28, 1993.

¹⁶ “Antitrust and Technological Innovation,” *Issues in Science and Technology*, Winter 1998.

¹⁷ “On the Internet, Toys R Us Plays Catch-Up,” *Wall Street Journal*, August 19, 1999.

¹⁸ *Forbes*, August 23, 1999.

respond. And guess who is making these risky first offers? In category after category, whether it's books, toys, music or shoes, Web natives are striking first, while traditional merchants worry about cannibalizing store sales or alienating sales and distribution partners.¹⁹

Financial industry giants are also feeling the impact of upstart entrepreneurs. Traditional stock markets are being challenged by on-line electronic communications networks (ECNs), which the *Economist* says are "threatening to make old-type exchanges extinct."²⁰ The magazine notes that, "...the exchanges' trouble is that their decision-making is often painfully slow and conservative, because so many members have an interest in preserving the status quo." A similar story is being played out in on-line stock trading and on-line securities underwriting.

Large, established companies are responding and attempting to become more entrepreneurial. In recent decades, corporate hierarchies have become flatter, and firms are pushing decision-making down to line managers. Big companies are trying their best to mimic the entrepreneurialism of small companies, and many will succeed. But the economic importance of outsider entrepreneurs implies that public policy should not favor established firms, and should remove barriers to start-ups for competitive challengers in every industry.

2. Entrepreneurs as Generators of Growth and Jobs. Rising levels of global competition are providing challenges for U.S. businesses in many industries. Seeking higher levels of productivity to respond to competitors worldwide, U.S. corporations in automobiles, semiconductors, and other industries have invested heavily in technology, refocused their operations, and restructured their labor forces.

Recently, American-style corporate restructuring has become just as much a European and Japanese phenomena. Many European and Japanese corporations are "downsizing" and laying-off thousands of workers. The Organization for Economic Cooperation and Development (OECD) notes that Japanese corporate profitability has fallen in the 1990s with the result that workforce rationalization is now a top priority.²¹ In one of many examples, losses at Japanese electronics giant NEC are causing the firm to shed 15,000 workers.

¹⁹ *Washington Post*, August 5, 1999.

²⁰ *Economist*, August 7, 1999.

²¹ *OECD Economic Outlook*, Chapter IV, OECD, June 1999.

In such a competitive climate, the important question for all countries is: where will the new jobs come from? In a flexible and dynamic economy, entrepreneurs can create new jobs by assembling financing, devising marketing plans, and rapidly growing a new business. By contrast, in an economy that dissuades entrepreneurship by excessive regulations or other disincentives, growth will slow and unemployment will rise. Consider Japan's dilemma, as noted by the *Economist*:

Japan's shortage of entrepreneurs is a real worry. Big employers are horribly overstaffed. They are now shedding jobs almost as fast as American firms did a decade ago. More young companies are needed to hire these people instead. Yet for over a decade, Japan has been losing more companies than it has created.²²

Some recent studies have sought to measure statistically the relationship between entrepreneurship and economic growth. A 1997 study by economists at Erasmus University in the Netherlands examined differences in entrepreneurship and growth across twelve European countries.²³ Their analysis found that those economies that have fostered greater entrepreneurship, including the United Kingdom and the Netherlands, have been rewarded with greater economic growth and lower unemployment. By contrast, France and Germany are still wedded to the "managed economy," and have suffered with slower growth and higher unemployment.

The link between economic growth and entrepreneurship is confirmed by a major new study, the *Global Entrepreneurship Monitor*, conducted by Babson College and London Business School researchers.²⁴ The study used surveys, interviews, and official statistics to determine differences in entrepreneurship between ten industrial countries. The researchers found large variations in entrepreneurship between the countries, as shown in Table 1. Entrepreneurship was measured by the percentage of the adults that have started a business. At 8.4 percent, the U.S. rate of entrepreneurship was by far the highest, and more than twice as high

²² *Economist*, February 13, 1999.

²³ *Sources of Growth: The Entrepreneurial Versus the Managed Economy*, David Audretsch and Roy Thurik, 1997.

²⁴ *Global Entrepreneurship Monitor*, Paul Reynolds, Michael Hay, and Michael Camp, Babson College-London Business School-Kauffman Center for Entrepreneurial Leadership, 1999.

as the ten-country average of 3.6 percent. Other studies have also found that start-up rates are the highest in the United States, mixed in Europe, and low in Japan.²⁵

The researchers then statistically compared differences in entrepreneurship to GDP growth rates. They concluded that variations in entrepreneurship account for about one-third of the variation in economic growth rates between countries.

Table 1: Levels of Entrepreneurship

Adults starting businesses as a percentage of adult population

High		Medium		Low	
United States	8.4%	Italy	3.4%	Germany	2.2%
Canada	6.8%	United Kingdom	3.3%	Denmark	2.0%
Israel	5.4%			France	1.8%
				Japan	1.6%
				Finland	1.4%

Source: Babson College GEM study, 1999.

C. American Risk-Takers

Substantial variations exist in levels of entrepreneurship across countries, as confirmed by the Babson College study. Variations seem to stem both from differences in cultural factors (discussed here) and differences in incentives facing potential entrepreneurs (discussed in the next section).

A major OECD study on entrepreneurship in 1998, *Fostering Entrepreneurship*, notes that there is a “near unanimous” view among experts that culture plays an important role in determining variations of entrepreneurship across countries.²⁶ Anecdotal evidence supports this conclusion. A Blair government poll in England found that “entrepreneur” conjured up images of a “sharpie, exploiter, or freebooter.”²⁷ The Babson College entrepreneurship study found that just 9 percent of Japanese and 38 percent of British thought that “starting a new business is a respected occupation.” This compares to over 91 percent of Americans asked the same question.²⁸

Japan seems to have lost some of the entrepreneurial zeal that helped build its post-war industrial success. In a recent profile of an elderly Japanese entrepreneur, the *Economist* noted that now such

²⁵ *Technology, Productivity and Job Creation*, OECD, 1998. p.223.

²⁶ *Fostering Entrepreneurship*, OECD, 1998. p.50.

²⁷ “Matters of Spirit,” *Forbes*, August 9, 1999.

²⁸ *Global Entrepreneurship Monitor*, Babson College, 1999.

"self-made men...attract ridicule and condescension in snooty Japan."²⁹ According to one U.S. high-tech leader, "the risk-taking culture, which is almost a badge of honor in Silicon Valley, is not present in Japan."³⁰

In the United States, entrepreneurship is widely admired for building meccas of innovation such as Silicon Valley. Entrepreneurs put aside stable careers for the uncertainty of an untried scheme. They want to succeed, but in an industry as dynamic as high-tech they often fail due to misjudgment or bad luck. Observers think that there is no shame in failure in Silicon Valley, and most entrepreneurs get up and try again. A new report by the National Research Council describes Silicon Valley as "a business culture that encourages people to strike out on their own. Failure is not welcome, but is tolerated. In fact, venture capitalists seem more willing to invest in someone who already has failed than in a first-time entrepreneur."³¹

American investors also seem to be more willing to take risks than foreign investors. The high-risk U.S. venture capital market is about four times the size of Europe's, as discussed in Section 2.E. The character of the U.S. market is also tilted more towards risky endeavors. A much greater share of U.S. venture capital goes towards high-tech firms, and a greater share goes towards early-stage financing than in Europe.

The American entrepreneurial culture has not only generated a high level of business start-ups, entrepreneurs have also created important high-tech institutions such as the venture capital market and NASDAQ. In addition, entrepreneurs are catalysts in breaking down regulatory barriers and jump-starting competition in new growth industries. In telecommunications, MCI challenged the long-distance telephone status quo that had lasted for decades, and helped initiate the 1984 break-up of AT&T. Therefore, entrepreneurship can be a powerful agent of growth and change in many forms.

D. Entrepreneurial Incentives and Disincentives

1. The American Marketplace. The United States presents the entrepreneur with 270 million consumers and millions of business

²⁹ *Economist*, February 13, 1999.

³⁰ "The U.S. Environment for Venture Capital and Technology-Based Start-Ups," Charles Geschke, President Adobe Systems, *Harnessing Science and Technology for America's Future*, National Research Council, 1999. p.116.

³¹ *Harnessing Science and Technology for America's Future*, National Research Council, 1999. p.23.

customers within a wealthy and unified national market. Historically, the strong federal Constitution reduced states' ability to erect interstate trade barriers. As a result, U.S. firms can build great economies of scale and share ideas and technology continent-wide. Historians think that the large size of America's domestic market was a key factor in our more rapid technological advancement and growth than other major countries.³²

To an entrepreneur, the potential payoff from a risky innovation is greater the larger the market it can be exploited in. As economist Paul Romer notes, "if barriers to trade meant that a computer operating system written in Washington state could only be used in Washington state, it would worth far less than if it could be used all over the world."³³ Empirical studies have shown that one reason for the high U.S. industrial R&D effort compared to other countries is our large domestic market size.

The large U.S. market may give a particularly powerful advantage to the high-tech sector because of the strong geographic "clustering" tendency of high-tech firms. Silicon Valley and other technology clusters seem to develop because of knowledge "spillovers," close proximity to "angel" and venture capital financing, and the availability of skilled workers. A large market means strong technology clusters, as noted by the OECD:

The size of clusters is limited by the size of the market...thus there is some evidence suggesting that the United States is more cluster-intensive than Europe because the U.S. market is larger than national European markets, which are still segmented as a result of different national tax regimes, regulations, and policies which favor national products (i.e. national champions).³⁴

U.S. policymakers should aim to ensure that the U.S. market remains open with a minimum of state-level limits on commerce. For example, one impediment to a unified national market under telecommunications deregulation is the crazy quilt of different state

³² "Why, Indeed, in America? Theory, History, and the Origins of Modern Economic Growth," *NBER Working Paper 5443*, Paul Romer, 1996.

³³ "Why, Indeed, in America? Theory, History, and the Origins of Modern Economic Growth," *NBER Working Paper 5443*, Paul Romer, 1996.

³⁴ *OECD Economic Surveys, United States*, OECD, 1997.

telecom laws, subsidies, and local rate structures.³⁵ Similarly, there is concern that the huge potential and rapid growth of e-commerce may be slowed by state and local tax policies. There are about 7,600 local sales taxes in the United States creating a complicated maze for Internet merchants. A new report on e-commerce by the National Tax Association noted that "this myriad of tax rates imposes significant administrative burdens on multi-state sellers, particularly smaller sellers whose ability to sell nationally and internationally is enhanced by the advent of electronic commerce."³⁶

2. Disincentives to Entrepreneurship. While American high-tech entrepreneurs begin with the advantage of a large and wealthy domestic market, government policy can create disincentives to entrepreneurs in any country. From a broad perspective, countries with larger government sectors tend to have lower economic growth rates, as confirmed by numerous empirical studies. A 1997 OECD cross-country regression analysis found that a 10-percentage point increase in a nation's overall tax rate reduces annual growth by about 0.5 percentage points.³⁷ Other studies have found larger effects. A 1998 study by Randall Holcolme, Robert Lawson, and James Gwartney found that a 10-percentage point increase in a country's government spending-to-GDP ratio reduces annual growth by 1.0 percentage points.³⁸

An important reason why larger governments tend to reduce economic growth is because they create disincentives for entrepreneurship. Labor market policies are one source of disincentives. For example, wage earners may be less inclined to strike out on their own in a business start-up if labor market regulations prescribe too generous a set of benefits for wage-paying jobs. Alternately, if unemployment benefits are too generous, jobless workers will be less interested in trying their hand at a business start-up. Similarly, high unionization rates can reduce workers' incentives to join a start-up because if the venture fails and they went back to wage work, they may lose union seniority.

Such labor market disincentives appear to be part of the explanation for why U.S. entrepreneurship rates are higher than

³⁵ "Telecom's Tragic Reform Tale," David Dorman, CEO of PointCast Inc., *Upside Today*, March 15, 1998.

³⁶ *Communications and Electronic Commerce Tax Project Final Report*, National Tax Association, Sept., 1999.

³⁷ *OECD Economic Outlook*, OECD, June 1998. p.159.

³⁸ "The Scope of Government and the Welfare State," *Cato Journal*, Fall 1998.

Europe's. Also, high unemployment in many European countries may, in itself, dampen entrepreneurial activity. Workers may not want to leave a wage job to create a risky start-up because if it fails, they may have a tough time finding a job again. About half of all start-ups fail within the first five years, a fact that must give pause to any potential entrepreneur in a high unemployment country.³⁹ The next two sections look at the disincentives to entrepreneurship created by taxation and regulation.

3. Taxation. Entrepreneurial businesses take risks with new technologies and new markets if they foresee a chance to earn substantial rewards. Riskier projects must hold the potential of earning higher than normal after-tax returns in order to attract investment. Taxes place a wedge between the gross return from an investment, and the after-tax return to the entrepreneur and investor, and thus create an important disincentive to risk-taking entrepreneurial activity.

Progressive tax systems, which have marginal tax rates that rise with income, are a particular bane for entrepreneurial activity. Under progressive taxation, a potential entrepreneur with a salary job may be reluctant to trade a stable income to start a risky venture if a large and rising share of the returns to entrepreneurial investment is redirected to the tax collector.

A 1997 study by tax economists Robert Carroll, Douglas Holtz-Eakin, Mark Rider, and Harvey Rosen examined the effect of changes to the top marginal income tax rate on entrepreneurial investment.⁴⁰ Using sole proprietor tax return data, the study examined small business investment spending before and after the 1986 Tax Reform Act that substantially changed individual income tax rates. The study found that a 5-percentage point increase in marginal tax rates would have a "substantial impact on entrepreneurs' investment spending," with an average capital investment reduction of 10 percent.

The study noted that high tax rates can reduce investment in two ways. First, taxation raises the "user cost of capital" to an entrepreneur considering an investment. This is the hurdle rate of return that a potential investment must earn before it is considered to be a worthwhile project. Higher taxes increase the cost of capital, thus making fewer investments worth undertaking. Second, taxation directly reduces the cash flow available to an entrepreneur. The more an entrepreneur's revenue stream is channeled towards tax payments,

³⁹ *Fostering Entrepreneurship*, OECD, 1998. p.24.

⁴⁰ *Entrepreneurs, Income Taxes, and Investment*, Robert Carroll, Douglas Holtz-Eakin, Mark Rider, and Harvey Rosen, University of Michigan Business School, Working Paper Series No. 98-16, 1997.

the less will be available for investment spending or other business purposes.

The negative effects of high marginal tax rates on business formation and investment have led most industrial countries to make substantial reductions in statutory tax rates since the 1980s. OECD figures show that the top personal income tax rate across 25 OECD countries fell 12.4 percent between 1986 to 1997, as shown in Table 2.⁴¹ Similarly, top corporate income tax rates fell 10.3 percent during this same period. The United States lowered income tax rates substantially in the 1980s, but raised them again in the 1990s. The top personal income tax rate was increased from 28 percent in late 1980s to 39.6 percent in 1993, and the corporate income tax rate was increased from 34 percent to 35 percent in 1993.

Table 2: Change in Top Tax Rates, 1986-1997

Selected Countries	Top Individual Rate	Top Corporate Rate
United States	-10.4	-11.0
Japan	-20.0	-5.5
Germany	0.0	-11.0
France	-11.0	-11.7
Italy	-11.0	0.0
United Kingdom	-20.0	-2.0
Canada	-2.7	-7.0
Average - 25 OECD countries	-12.4	-10.3

Note: percentage point change for the central government top statutory rate.

Source: *OECD Economic Outlook*, OECD, June 1998.

For entrepreneurial business formation in high-tech, low tax rates on capital gains are particularly important. Start-up and young high-tech firms are likely to retain all of their earnings during their early high-growth phase. Therefore, investors in these firms receive returns in the form of capital gains, in contrast to the dividend yields received by investors in older, slow-growth firms. As a result, the capital gains tax rate directly impacts the willingness of investors to place their funds into start-up and growth-oriented firms.

For the potential investor, technology start-up companies offer particularly high risks because of the fast-changing nature of high-tech markets. Many high-tech firms "are characterized by significant intangible assets, expect years of negative earnings, and have uncertain prospects, and are unlikely to receive bank loans or other debt

⁴¹ *OECD Economic Outlook*, OECD, June 1998.

financing.”⁴² U.S. capital markets have responded to these special needs with specialized flows of equity, including venture capital and angel financing. As such, taxes on equity, particularly capital gains, are especially important to high-tech start-ups.

The finances of the U.S. biotechnology industry make this investment picture clear. There are about 1,300 biotechnology firms, two-thirds of which have fewer than 135 employees. The industry spent \$9.9 billion on R&D in 1998, representing 53 percent of industry revenues. A minority of firms has approved products or revenues, and the industry as a whole reports a net loss. Investors will not receive returns in the form of dividends for a long time since it takes years and \$200-\$350 million to bring a new biotech drug to market.⁴³ Investors receive a return in the form of capital gains if and when a company’s drug candidates or other products show promise. Biotech firms survive on a thin “umbilical cord” to the capital markets, which are sensitive to government policies that threaten the long-term payoff.⁴⁴

Table 3: Maximum Individual Capital Gains Tax Rate

Selected Countries	Long-Term Capital Gains Rate
Australia	48.5%; asset cost is indexed
Belgium	Exempt
Brazil	15%
Canada	23.5%
Denmark	40%; shares under \$16,000 exempt if held 3+ years
France	26%; annual exclusion of \$8,315
Germany	Exempt
Hong Kong	Exempt
Italy	12.5%
Japan	20% of net gain or 1.25% of sales price
Korea	20%; shares traded on major exchange exempt
Netherlands	Exempt
Sweden	30%
Taiwan	Exempt (local company shares)
United Kingdom	40%; shares valued at less than \$11,225 exempt
United States	20%
Average 24 countries	15.9%

Source: Arthur Anderson LLP for American Council for Capital Formation, 1998.

So that investors receive sufficient rewards for supporting risky high-tech entrepreneurship, it makes sense for policy to encourage such investments. As it turns out, most major industrial nations do provide favorable tax treatment for long-term capital gains (see Table 3). A number of countries including Germany, the Netherlands, and Belgium exclude long-term capital gains from tax altogether. A 1998

⁴² *What Drives Venture Capital Fundraising*, Paul Gompers and Josh Lerner, NBER Working Paper 6906, January 1999.

⁴³ “Some Facts About Biotechnology,” Web page of BIO at <www.bio.org>

⁴⁴ “Frontier Ethics,” *National Journal*, June 5, 1999.

survey found the average long-term individual capital gains rate across 24 industrial countries was 15.9 percent.⁴⁵

Historically, the U.S. tax code has provided preferential treatment of capital gains, either by a preferential rate or an income exclusion. In 1997, Congress lowered the maximum rate on individual long-term capital gains to 20 percent, although the effective rate is higher in some cases due to income phase-outs on various tax code provisions. Additionally, because capital gains realizations are not indexed for inflation in the tax code, higher inflation rates substantially increase the effective tax rate on gains.

4. Regulation. The paperwork and regulatory burden for an entrepreneur begins the day a business is registered. It continues throughout the life of a firm including when it hires workers, expands across state lines, imports supplies, battles litigation, expands a factory, discards waste, designs employee work areas, creates a pension plan, introduces a new product which requires regulatory approval, or pays income, payroll, sales, or property taxes. All these activities consume resources and shift an entrepreneur's focus away from growing his or her business.

Some estimates have been made of the overall average costs to U.S. businesses of government regulations and red tape. Studies find that small businesses tend to have higher average regulation costs per employee than larger businesses. The Small Business Administration found that the average annual cost of regulation and tax compliance amounted to about \$5,000 per employee in small firms, and about \$3,400 in large firms (1992 figures).⁴⁶

The good news for the U.S. economy is that some types of regulatory burden appear to be less than in other industrial countries. For example, the OECD finds that business registration generally involves less red tape in the United States than in Europe.⁴⁷ In some countries, such as Italy, it takes up to half a year to jump through the administrative hoops to register a business start-up. A number of European countries even require minimum levels of capital and a business plan certified by an "expert" in order to register a business.

Bankruptcy laws in the United States make it relatively easy for entrepreneurs to go from a failed business to attempting a new start-up. By contrast, in some European countries failed entrepreneurs can be

⁴⁵ *An International Comparison of Capital Gains Tax Rates*, Arthur Andersen LLP study completed for the American Council for Capital Formation, August 1998.

⁴⁶ *Fostering Entrepreneurship*, OECD, 1998. p.64.

⁴⁷ *Fostering Entrepreneurship*, OECD, 1998. p.54.

liable for debts the rest of their life, thus dissuading them from starting a business to begin with.⁴⁸ However, bankruptcy law must be a balance because if it is tilted too strongly against creditors, they may hesitate to lend to risky start-ups.

Labor market regulation has a widely cited dampening effect on business expansion and hiring. For example, "employee protection" legislation in Europe, which makes it difficult to lay off workers, makes entrepreneurs less likely to hire workers. Mandates that require employers to provide various employee benefits raise costs and reduce incentives to hire. Such policies in Europe have resulted in higher unemployment rates and reduced willingness on the part of potential entrepreneurs to leave a comfortable salaried job to start a new business. Much labor market regulation is a remnant from the "managed economy" of yesteryear, and needs to be retooled for the new entrepreneurial economy.

In some types of regulatory and administrative burdens, American entrepreneurs are, however, probably no better off than entrepreneurs abroad. There is a large room for improvement in the complex U.S. income tax code, for example. Americans now spend over five billion hours per year filling out tax forms, resulting in total collection costs of about 10 cents for every dollar raised.⁴⁹ Studies have shown that the relative burden on small businesses of tax compliance is higher than for large companies.⁵⁰

The costs of litigation also impose substantial burdens on technology-intensive U.S. industries, and create a dampening effect on innovation. A company with a tried and true product design may hesitate to experiment with newer technologies because any unforeseen flaws may attract lawsuits. Class action lawsuits related to fluctuating share prices have also been a problem for the high-tech sector. Because of the large uncertainties in technology markets, tech company share prices tend to have large price swings. This has prompted class action lawyers to bring hundreds of suits against tech firms, forcing them to spend millions of dollars on legal defense costs.⁵¹ Congress responded with federal litigation reform measures in

⁴⁸ *Fostering Entrepreneurship*, OECD, 1998. p.184.

⁴⁹ "Making Tax Choices: A Guide to the Issues and Alternatives," David Bradford and Joel Slemrod, *Tax Notes*, September 1, 1996.

⁵⁰ *The High Cost of Tax Compliance for U.S. Business*, Tax Foundation, May 1994.

⁵¹ Stanford University Securities Class Action Clearinghouse Web page at <securities.stanford.edu>.

1995, but litigation against high-tech firms has now moved to the state court arena.

Price regulation is a problem for a number of high-tech industries. It adds uncertainty for entrepreneurs about the likely returns to new investment. In telecommunications, despite a general trend towards deregulation, price controls and subsidies on local residential phone service discourages investment in this market. By contrast, the freer long-distance and business phone markets have attracted investments by dozens of competing providers. As the head of one telecom company noted, "the innovation, competition, and investment in the business telephone market are not coming to the home because they are stifled by the economically irrational, regulated pricing structure."⁵²

Price regulation has also been a concern of the pharmaceutical and biotechnology industries whenever the federal government considers expanding its presence in the health care industry. The investment disincentive of price controls was described in recent Joint Economic Committee hearings by Gordon Binder, CEO of biotech firm Amgen:

Innovation is expensive, risky and therefore fragile. Price controls—even the threat of price controls—discourages it, badly. I have here a chart of total pharmaceutical company R&D spending in the U.S. during each year of the last decade. You can see that, in that time, the climb was steady - with one exception. In 1994 it almost stopped. What happened in 1994? The President put forward his health care program and it included price controls. This is a simple fact: all policies to advance the biotechnology and the development of pharmaceuticals and encourage industry growth into the next century will be far less successful if Congress imposes any form of price controls on pharmaceuticals.⁵³

As the *Financial Times* reported, the current lack of price regulations has given U.S. pharmaceutical firms a big advantage over European firms where drug prices are more tightly controlled. The lack of regulation "has given U.S. drug companies...a huge advantage. Over

⁵² "Telecom's Tragic Reform Tale," David Dorman, CEO of PointCast Inc., *Upside Today*, March 15, 1998.

⁵³ Testimony of Gordon Binder, CEO of Amgen, before the Joint Economic Committee, June 16, 1999.

the past decade of high domestic growth, it has provided them with a torrential income stream to reinvest in the ever-more costly business of finding new drugs."⁵⁴ As a result, U.S. firms are pulling far ahead of European firms: by 2002, 20 of the world's 25 top-selling drugs are projected to be American, compared to just three that will be European.⁵⁵

2. OPEN-MARKET DYNAMISM

A. Entrepreneurs and Open Markets

The 19th-century French economist Jean-Baptiste Say described the entrepreneur's role in the economy as follows:

The entrepreneur shifts economic resources out of an area of lower and into an area of higher productivity and greater yield.⁵⁶

Entrepreneurs perform the same vital function today. By shifting workers and investment from old industries to newer, higher-valued industries, entrepreneurs generate economic growth and rising living standards. Entrepreneurs and their investors bear substantial risk because no one knows in advance whether these new uses of resources will, in fact, turn out to be higher-valued than the old uses.

In a new book, Michael Cox and Richard Alm describe how the resource-shifting role of entrepreneurs continuously reinvents the nation's workforce.⁵⁷ From the mid-1980s to the mid-1990s, General Electric lost 65,000 workers, but Motorola gained 49,000; AT&T lost 207,000, but Lucent, MCI, Sprint and Bell South gained 202,000; Sears and K-mart lost 196,000, but Wal-Mart gained 624,000; and so on.

Federal Reserve Chairman Alan Greenspan recently noted that "the American economy...is in the grips of what the eminent Harvard professor Joseph Schumpeter many years ago called 'creative destruction,' the continuous process by which emerging technologies

⁵⁴ "Pharmaceutical Groups Search for Quick Fix," *Financial Times*, September 13, 1999.

⁵⁵ "Pharmaceutical Groups Search for Quick Fix," *Financial Times*, September 13, 1999.

⁵⁶ *Economist*, February 20, 1999.

⁵⁷ *Myths of Rich and Poor*, Michael Cox and Richard Alm, 1999.

push out the old.”⁵⁸ The ability of entrepreneurs to push out the old, and shift resources to new higher-valued uses can be maximized only when markets are open to competition, and when entrepreneurs have sufficient incentives to take the risks needed to challenge the existing order.

Unfortunately, governments often erect barriers to entrepreneurs in product markets, financial markets, and labor markets. These include:

- **Market Entry:** restrictions that make it difficult or illegal for entrepreneurs to break into an industry;
- **Market Structure and Evolution:** prescription of standards or industry structures which preclude the market from evolving to meet new demands;
- **Labor Markets:** labor laws which raise costs, and cause rigidities and reduced incentives to hire;
- **Financial Markets:** an inefficient financial system that makes it difficult to raise money for new ventures.

Barriers in any of these areas may impede the economy’s dynamism, and reduce the nation’s growth potential, as discussed in turn below.

B. Market Entry

The rise of entrepreneurialism in the telecommunications industry after the 1984 break-up of AT&T provides a dramatic illustration of a growth boom spurred by dismantling market entry barriers. The court-ordered break-up, and the opening of the long-distance and telecom equipment markets, loosened the floodgates to a rush of investment led by upstarts such as MCI. The break-up led to falling long distance rates, surging investment in fiber optic cables, the rise of wireless telecom, and other advancements.

But the AT&T break-up was just the beginning of the long process of U.S. telecommunications deregulation. Many restrictions remained after 1984 including market-entry prohibitions placed on the regional Bell operating companies. Congress pushed telecom deregulation further with the passage of the Telecommunications Act of 1996 that attempted to remove these and other entry barriers. However, the 1996 Act has been only partly successful. Competition has been slow to come to the local residential market, and regional Bell operators have not been able to enter long distance markets yet. Some analysts blame excessive regulatory burdens for the slow progress after the 1996 Act,

⁵⁸ Quoted in “Study Predicts Sustainable Growth,” *Washington Post*, September 9, 1999.

and suggest that Federal Communications Commission (FCC) regulatory power over the industry has actually increased.

Nonetheless, telecom deregulation has unleashed entrepreneurial forces that will likely push technology ahead despite any regulatory shortcomings. Wireless systems, for example, are increasingly sophisticated and may ultimately provide competition for phone and cable wire systems throughout the telecom arena.

While U.S. telecommunications services have grown quickly under deregulation, the Internet has exploded due to "unregulation," according to a new study by a staff counsel at the FCC.⁵⁹ The study describes how the lack of regulation of the Internet and Internet applications has generated an explosion of entrepreneurial activity. The report finds that, "market forces have driven the Internet's growth, and the FCC has had an important role to play in creating a deregulatory environment in which the Internet could flourish."

While U.S. telecom deregulation has been slow and complex, it has been sufficient to put the U.S. in the lead against countries that have been even slower to deregulate. In Japan, the near-monopoly telecom provider NTT has stifled Internet usage with connections that can cost hundreds of dollars per month for even moderate usage. As a result, only 13 percent of Japanese homes have Internet accounts, compared to 32 percent of Americans. And e-commerce has been stifled because "the Ministry of International Trade and Industry (MITI) has mostly been a hindrance rushing out regulations for firms doing business on-line in Japan," according to the *Economist*.⁶⁰ Japan's regulated and high-cost telecom is "clearly hobbling the world's second-largest economy as it struggles to keep pace with America in the fast-changing digital age. And it is only one of many impediments to development of Internet businesses here," according to the *Washington Post*.⁶¹

While the Internet itself has so far blossomed in a generally deregulated mode, some backlashes are beginning to occur from entrenched interests as e-commerce continues to expand. In a new report, the Progressive Policy Institute (PPI) described some of the backlashes that threaten to block e-commerce growth:⁶²

⁵⁹ *The FCC and the Unregulation of the Internet*, Jason Oxman, Counsel for Advanced Communications, Federal Communications Commission, July 1999.

⁶⁰ *Economist*, August 7, 1999.

⁶¹ *Washington Post*, August 16, 1999.

⁶² *The New State Economy Index*, Progressive Policy Institute, 1999. p.40.

- A legal group in Texas won a ruling that could lead to a ban on sales of legal software that helps families create simple documents like wills and contracts without the help of a lawyer.
- The American Federation of Teachers and university teachers in Washington are protesting against distance learning on-line.
- State professional licensing requirements that do not recognize licenses from other states limit the practice of tele-medicine and other on-line professional services.

Such threats can stifle the dynamism that is at the heart of the expanding American high-tech sector. Economic growth comes from allowing entrepreneurs to experiment in new markets, and to provide better services at lower costs to consumers. The PPI report concludes that "...businesses and interest groups...must not be allowed to use the power of government to protect themselves against economic change that benefits all consumers."

C. Market Structure and Evolution

Early this century, Soviet planners visited Henry Ford's massive Rouge automobile complex in Detroit and were inspired to build equally massive car, steel, and electricity plants. Ford the innovator later switched to smaller, dispersed plants to take advantage of the growth in electricity power, while the Soviets stuck to their Big is Better approach. The Soviet planners who tried to mimic American economic strength from the top-down didn't realize that what was important was the free market *process* behind the American factories, not the factories themselves. The open markets that created the factories should have been copied, not the particular structure that American industry took.

A similar mistake is often made by pundits and planners in advanced economies. For a long time, big businesses were thought to be the sole driver of innovation, while "small firms were viewed negatively in the managed economy because their sub-optimal size imposed a less efficient use of resources."⁶³ Large "national champions" were favored to take on foreign competition. Some still hold these views today, while others now make the opposite error and trumpet the benefits of small businesses without appreciating the huge contributions of large corporations.

The reality is that small businesses and large corporations play complementary roles in today's complex economy. In the high-tech

⁶³ *Sources of Growth: The Entrepreneurial Versus the Managed Economy*, 1997. p.6.

sector, a common pattern is for intense start-up activity to occur in a diverse array of small firms, thus creating many incubators of new ideas. Large companies with greater resources then give a boost to the most promising innovations by investment or acquisition. For example, the Internet company Hotmail was started by an independent entrepreneur, funded by venture capitalists, and then acquired by Microsoft for \$400 million.⁶⁴ Another recent example is Merrill Lynch's investment in Archipelago, an on-line stock-trading network that has applied to become an electronic stock exchange.⁶⁵

Like earlier pilgrims to Ford's factories, foreign officials today trying to discover the secret to America's success flock to Silicon Valley. There they will see a huge diversity of business structures that provide great flexibility to the U.S. high-tech industry. In some high-tech industries, such as pharmaceuticals, a large size is important in order to generate economies of scale. But other industries, such as biotechnology, thrive with hundreds of small and medium-size companies. Still other industries, such as software, exhibit a diverse collection of very small and very large companies.

While large corporations have certain innovation advantages, such as being able to fund large R&D budgets, small firms may have a greater tolerance for risky projects, be more open to new ideas, and be more willing to serve small niche markets.⁶⁶ As *Red Herring* magazine points out, even Lucent technologies, which has 30,000 scientists in its Bell labs, has a \$100 million venture capital fund to search out good ideas in small companies.⁶⁷ Netscape co-founder Marc Andreessen summarizes the various strengths of big and small: "big companies are systematically ineffective at incubating new ideas, and small companies lack the sales and marketing forces to bring new ideas to market."⁶⁸

In an open and dynamic economy, market structures and firm sizes are always changing. Most obviously, small firms often grow into big firms. The original Silicon Valley high-tech start-up, Hewlett-Packard, began in 1938 in Dave Packard's garage. Packard and Bill Hewlett started with \$500 and an idea that grew into a company with \$43 billion in sales and 125,000 employees.

⁶⁴ *Washington Post*, August 15, 1999.

⁶⁵ "Merrill Announces It Will Purchase Stake in Electronic Trader Archipelago," *Wall Street Journal*, September 10, 1999.

⁶⁶ *SMEs: Employment, Innovation and Growth*, OECD, 1996. p.43.

⁶⁷ "The New Start-Up," *Red Herring*, October 1998.

⁶⁸ "The New Start-Up," *Red Herring*, October 1998.

The diversity and dynamism in high-tech businesses would seem to make it a losing strategy for governments to prescribe “top-down” solutions for industry structures. In telecommunications, deregulation has led to a frenzy of business restructuring. Some companies are merging to build a global scale or gain access to technologies they don’t have. AT&T, for example, acquired the nation’s second largest cable provider, TCI, to launch much-needed local service competition to the regional Bells. Some firms are divesting to focus on core businesses - AT&T, for example, spun off its multibillion dollar manufacturing arm, Lucent.

The huge amount of uncertainty in telecommunications, like other high-tech industries, is helping fuel the frenzy of restructuring. In telecom, for example, there are now at least four strategies to deliver new broadband services to the home including cable, digital subscriber line (DSL), satellite, and wireless.

Unfortunately, federal telecom regulators seem to be rooted somewhat in the past, with the hopes of judging the industry’s best structure. The FCC laboriously reviews each merger to see if it’s “in the public interest,” sometimes taking over six months to do so. This procedure presumes knowledge of the uncertain future on the part of federal regulators that even businesses don’t possess. Since mergers have to be reviewed by Justice Department antitrust lawyers anyway, this added layer of regulation seems unnecessary.

As it turns out, governments and pundits are often wrong with their technology industry prescriptions. In a recent paper, Professor David Mowery of the University of California at Berkeley describes how past expert prescriptions for high-tech turned out to be off the mark.⁶⁹ He notes that in the 1980s pundits said that new entry to the semiconductor field would be detrimental to U.S. competitiveness, and that capital markets put too much pressure on firms for short-term financial performance. Some U.S. high-tech firms were criticized for abandoning unprofitable lines and for restructuring, which many called “hollowing out.” He notes that in these instances and others, the companies turned out to be right and the pundits wrong, as the U.S. high-tech sector bounced back after strong foreign competitive threats.

America’s industrial strength is its dynamism, not a scheme to organize or manage industry, which many governments have favored in the technology field. This point is made by the *Economist* magazine in a recent article on the chemical industry:

⁶⁹ “America’s Industrial Resurgence,” David Mowery in *Issues in Science and Technology*, Spring 1999.

America's strength has been sustained over decades because it has successfully transitioned from one source of advantage to the next – rather than resting on, or trying too hard to entrench, the advantages that it started with. The contrast with Germany (in some respects) and Britain (in many) is sharp.⁷⁰

This ability to quickly adapt to changing circumstances is based on America's high levels of entrepreneurship, openness, and competition. Professor Mowery finds that open U.S. trade policies "propelled adoption of technology at a faster pace than in most Western European economies or in Japan, where trade restrictions and other policies kept prices higher."⁷¹ Therefore, open markets have allowed the U.S. economy to find quickly new sources of growth, rather than trying to hold on to its past successes.

A final note on the nature of open and flexible industry structures: open markets do not just mean more competition, they allow for more cooperation among firms as well. More competition and cooperation may seem like a paradox. But deregulation in recent decades has generally allowed more of both as cooperation and competition work side-by-side in the market economy. In fact, greater competition in many markets has given an impetus for companies to cooperate on high fixed-cost activities such as R&D.

Federal antitrust rules had thwarted R&D cooperation during the 1960s and 1970s, but Congress relaxed antitrust rules in the 1980s to allow cooperative R&D ventures between otherwise competitive firms. This has led to the creation of hundreds of cooperative research alliances.⁷² The *Economist* recently noted that sweeping away the rules for companies to share know-how and cooperate on R&D has had an "invigorating effect" on the U.S. economy.⁷³

There has been a growing realization that innovation and R&D approaches vary widely between industries. Research cooperation between businesses, and between businesses and universities, has both costs and benefits and may work well in some technology areas and not others. The complexity of the issues and the diversity of research

⁷⁰ *Economist*, March 6, 1999.

⁷¹ "America's Industrial Resurgence," David Mowery in *Issues in Science and Technology*, Spring 1999.

⁷² "Antitrust and Technological Innovation," David Hart in *Issues in Science and Technology*, Winter 1998.

⁷³ *Economist*, February 20, 1999. p.27.

methods means that “top-down” rules are inappropriate - the market appears to be the only mechanism capable of sorting out the most efficient approaches to innovation.

D. Flexible Labor Markets

In the new entrepreneurial economy, the U.S. labor market is shifting away from a focus on worker “control” towards worker “motivation,” with the high-tech sector leading the way.⁷⁴ In the past, large corporate hierarchies made decisions at the top, and then monitored work effort below. But today, businesses recognize the importance of motivating workers at all levels to be creative and to generate knowledge for faster responses to changing marketplace conditions. Companies have found that flexible work environments contribute to worker motivation and idea generation.

The best workforces in the new economy incorporate flexible hours, flexible performance-based salaries, independent contracting, and innovative compensation packages. The U.S. high-tech industry has been a leader in innovative work arrangements, ranging from casual dress to stock options.

To the high-tech entrepreneur, hiring workers is risky because high-tech markets change rapidly thus making future labor demands difficult to project. Governments can make hiring decisions even riskier by policies that make it difficult to lay off workers. In many European countries “employment protection” policies are thought to share the blame for sluggish job growth in recent years, as such laws make it difficult and costly to shed staff.⁷⁵ Employer surveys in countries with rigid employee protection laws confirm employers’ reluctance to hire new staff.⁷⁶

Unions can often reduce flexibility in work arrangements as well. Collective bargaining agreements can reduce the scope of performance-based pay, interfering with the ability of entrepreneurs to attract and reward top talent – a key requirement in high-tech industries. Here the United States and Europe sharply diverge as Europe has much higher unionization rates.⁷⁷ Union rules can also stand in the way of adopting new technology in the workplace. New

⁷⁴ *Sources of Growth: The Entrepreneurial Versus the Managed Economy*, 1997. p.16

⁷⁵ *Fostering Entrepreneurship*, OECD, 1998. p.19.

⁷⁶ *Fostering Entrepreneurship*, OECD, 1998, p.86.

⁷⁷ “Collective Responsibility,” *Financial Times*, September 13, 1999. See also *Employment Outlook*, OECD, July 1997.

machines on the shop floor often require new ways of working, which isn't always possible with rigid union rules.

Deregulated labor markets are often portrayed as a win for business and a loss for workers. But persistently high unemployment in heavily regulated European labor markets make clear that regulated markets don't make winners out of workers. France's unemployment rate, for example, has averaged above nine percent every year since 1983. France's current solution for unemployment is to mandate a nationwide workweek cut from 39 to 35 hours.⁷⁸ The strategy will likely cause the opposite - as unions prevent earnings from falling, employers will be stuck with a ten-percent cost increase. As the *Economist* notes, this "policy designed to create jobs would end up destroying them."⁷⁹ Less mandated "job security" in the U.S. has actually left America workers more secure because of the ease of finding a new job should they be displaced.

In the U.S. high-tech sector, the flexibility of the labor market coincides with the high mobility enjoyed by workers. Experts believe that American workers are much more mobile and willing to move substantial distances for work than are Europeans.⁸⁰ For technology industries, such mobility allows regional "clusters" of specialization to develop - such as software in Seattle - that draw experts from across the country.

High U.S. worker mobility translates into shorter average job tenures than other industrial countries, according to OECD figures.⁸¹ This may be of particular benefit to the high-tech sector because frequent job changing creates a rapid diffusion of new ideas. As skilled workers move to and from firms and university research labs, their knowledge moves with them. Such "knowledge spillovers" are a great source of strength for U.S. high-tech clusters.

The dynamic U.S. labor market is sometimes criticized when a high-profile workforce restructuring or downsizing occurs. But the new economic reality is that European and Japanese corporations are also restructuring under growing global competitive pressures. In Japan, the system of "lifetime employment" may be a thing of the past as poor profitability at many large corporations is leading to big job cuts.⁸² With Europe and Japan now experiencing their share of

⁷⁸ "Turning Back the Clock," *Financial Times*, July 29, 1999.

⁷⁹ *Economist*, April 15, 1999.

⁸⁰ *Wall Street Journal*, June 24, 1999.

⁸¹ *OECD Economic Surveys: United States*, OECD, 1997. p.156.

⁸² *OECD Economic Outlook*, Chapter IV, OECD, June 1999.

corporate restructuring, but with less business start-ups, they are left with higher unemployment.

E. Dynamic Capital Markets

1. Funding for High-Tech Growth Companies. Freewheeling and efficient financial markets have been central to the success of the U.S. high-tech sector. Any growing economy must have a mechanism to shift capital away from old industries towards new and higher-valued ones. U.S. capital markets have played this role and efficiently funneled billions of dollars to entrepreneurs in high-growth industries.

Many high-tech entrepreneurs initially depend on their own savings, personal debt, and loans from friends. If a business grows, it may look for external financing. External financing is a crucial lifeline for many high-tech start-ups because internal financing (i.e. profits) may not be generated for months or years in some start-ups. In recent years, U.S. high-tech entrepreneurs have reported good access to external financing for business start-ups and growth.⁸³ Some analysts even think that there is more money than good ideas in some areas, such as the Internet.⁸⁴

Entrepreneurs in Europe and Japan have not been so lucky because of their more heavily regulated financial markets. In Japan, for example, "fledgling entrepreneurs in this nation of prodigious savers complain that Japan's financial system, with its heavy reliance on big banks, entrenched manufacturers and long-term relationships, is ill-suited to the free-wheeling nature of Internet businesses."⁸⁵ Culture also seems to play a role in high-tech funding shortfalls. Commentators think that the risk-aversion of Japanese investors causes them to avoid putting their savings into venture capital funds or start-up companies.

U.S. high-tech entrepreneurs have relied on a uniquely strong and diverse mix of private and public equity to fuel their growth. While initial public offerings (IPOs) have been a high-profile part of the high-tech boom, private equity provided by "angel" investors and venture capitalists has been important in fueling the initial growth of many well-known high-tech successes including Cisco Systems, Intel, Apple, Microsoft, and Genentech.

⁸³ *Washington Post*, August 15, 1999. The *Economist* February 20, p.22 makes a similar point.

⁸⁴ "The New Start-Up," *Red Herring*, October 1998.

⁸⁵ *Washington Post*, August 16, 1999.

Private equity investors, whose investments are not traded on public exchanges, typically become involved before a high-tech start-up goes public. Despite complaints that U.S. financial markets are too short-term oriented, private equity investors represent “patient capital,” and may not see an investment payback for years.

2. Private Equity – Angel Investors. Typically, angels are mature investors, who are experienced in a specific high-tech industry and understand the challenges of a start-up. In addition to providing capital, angels typically sit on a young firm’s board of directors and provide valuable insight and advice. Angels often invest in high-tech firms that are close to home, and are thus one cause of the geographical “clusters” that shape the high-tech industry.

Angel investment is diverse in origin and doesn’t flow through organized channels. As such, it is difficult to accurately measure angel investment activity, but angels are thought to invest at least *twice as much* as the total for the venture capital industry.⁸⁶ Some experts believe that the importance of angels is even greater than that. There may be about 250,000 angel investors in the United States investing in about 30,000 firms annually.⁸⁷

Angels are usually wealthy individuals who are high-tech entrepreneurs themselves, and thus represent a “virtuous circle” of high-tech wealth creation. Successful high-tech entrepreneurs, such as the founders of Microsoft, Dell, and Oracle, channel their wealth and knowledge back into high-tech start-ups to create opportunities for new entrepreneurs. Microsoft billionaire Paul Allen has stakes in nearly 100 companies in telecommunications, biotechnology, and other areas. Michael Dell, founder of Dell Computer, has invested about \$1 billion into a range of e-commerce companies.⁸⁸

Because wealthy individuals are the force behind angel investment, it is no surprise that the United States has far more angel activity than other industrial countries, which generally have higher taxes and fewer wealthy investors. The Babson College entrepreneurship study (see Section 1.B.) examined the participation level in informal or angel business funding across countries. They found that in the United States 5.5 percent of adults have provided

⁸⁶ *OECD Economic Surveys: United States*, 1997. p.164.

⁸⁷ *New Entrepreneurial High-Growth Companies: Is There a Capital gap Warranting Federal Action?*, Congressional Research Service, February 26, 1999.

⁸⁸ “Dell’s CEO Bets His Own Cash on the Web,” *Wall Street Journal*, August 26, 1999.

informal start-up funds, compared to an average of just 3.3 percent in the other countries surveyed.

Consider the virtuous circle of U.S. high-tech wealth creation when compared to high-tax Sweden. In Sweden, 62 percent of GDP is claimed by the government sector, and the top marginal tax rate is 60 percent.⁸⁹ In this situation, few private individuals control sufficient financial assets to be able to invest in new business start-ups. As a result, Sweden has a low rate of entrepreneurship, as noted by the OECD:

...in some countries, such as Sweden, the limited capacity of households to accumulate capital due to solidarity-based wage policies and high social contributions and income taxes has been an obstacle for entrepreneurship development.⁹⁰

High net-worth individuals save a far higher average percent of their earnings than do others, so they are an important source of any nation's investment funds. More particularly, examining the number of millionaires across countries is one way to judge which economies have a sufficient supply of potential angel investors. The U.S. had at least 3.5 million households with net worth of more than \$1 million in 1996.⁹¹ By comparison, a 1997 study found just 965,000 millionaires (in European Currency Units, or ECUs) in seven large European economies (Germany, Britain, France, Italy, Spain, Switzerland, and Holland). In 1997, the ECU was worth 15 percent more than the dollar, while the seven European countries had a combined population 20 percent greater than the U.S.⁹² Therefore, it appears that the United States has at least *three times* the density of millionaires as Europe.

Greater numbers of wealthy individuals give the U.S. an advantage not just in angel investment, but in pre-angel investment as well. The OECD notes that, "since most capital in the earlier stages of an investment is provided either by the entrepreneur himself or persons close to him, low household wealth may reduce the capital available

⁸⁹ *OECD in Figures*, OECD, 1999.

⁹⁰ *Fostering Entrepreneurship*, OECD, 1998, p.81.

⁹¹ *The Millionaire Next Door*, Thomas Stanley and William Danko, 1996. Other estimates are much higher. For example, *Wired* magazine placed the figure at 8 million (September 1999, p.152)

⁹² "Switzerland, Britain have most millionaires per capita in Europe," *Agence France Presse*, September 14, 1998.

for start-ups.”⁹³ The OECD estimates that net household financial wealth equals 275 percent of GDP in the U.S., 200 percent in the United Kingdom, 140 percent in Germany, and just 80 percent in Sweden.⁹⁴

3. Private Equity—Venture Capital. One of the most entrepreneurial areas of the U.S. high-tech sector is the venture capital industry. As a firm grows beyond an entrepreneur’s or angel’s personal resources, venture capital firms are often approached for additional funding. Venture capital firms are typically organized as limited partnerships—an institutional form which aided the industry’s rapid growth.⁹⁵ The main sources of funds for venture capital firms are pension funds, endowments and foundations, corporations, and wealthy individuals.

Venture capital firms provide equity funding, assist in strategy, and may recruit experienced managers for young firms. Venture firms spread out the risks of technology investment by developing a portfolio of firms after screening of many business proposals. Venture capital firms are a diverse group: some are generalists, while others are specialist investors; some focus on early-stage investing, while others focus on later-stage firms. They often plan a firm’s growth strategy for a number of years before a public share offering, or a merger or acquisition.⁹⁶

Like angel investment, the “virtuous circle” of wealth creation in U.S. high-tech is evident in the venture capital market. Successful high-tech firms often invest in smaller start-ups through venture vehicles. Industry giants such as Intel, Microsoft, and AT&T pursue investments in start-ups that have complementary technology. For example, Intel holds an investment portfolio of more than 250 companies with a value of over \$3 billion.⁹⁷

U.S. venture capital investment has surged in the past three years from \$7.4 billion in 1995 to \$25.3 billion in 1998, according to National Venture Capital Association (NVCA) data.⁹⁸ Figures for the first half of 1999 show that venture capital investment has soared 72 percent over the first half of 1998. In 1998, 61 percent of venture

⁹³ *Fostering Entrepreneurship*, OECD, 1998, p.228.

⁹⁴ *Fostering Entrepreneurship*, OECD, 1998.

⁹⁵ *The Economics of the Private Equity Market*, Federal Reserve Board Staff Report, December 1995.

⁹⁶ “What is Venture Capital,” National Venture Capital Association Web page at <www.nvca.org>.

⁹⁷ *Red Herring*, August 11, 1999.

⁹⁸ *1999 Yearbook*, National Venture Capital Association.

capital investment went to information technology firms, 19 percent to medical and biotech firms, and the remaining 20 percent to non-technology firms.

Growth in U.S. venture capital investment that began in the late 1970s was mainly triggered by two policy changes.⁹⁹ First, deregulation of pension plan rules under ERISA (the Employee Retirement Income Security Act) in 1978 allowed pension funds to invest in higher-risk investments including venture capital. (Such restrictions still remain in other countries). Second, venture capital markets were stimulated by the individual capital gains rate cut from 49 percent to 28 percent in 1979, and to 20 percent in 1981.¹⁰⁰

As a result of the capital gains tax cut and more liberal pension rules, venture capital investments soared from under \$1 billion per year in the late 1970s, to over \$4 billion by 1983 as venture capitalists invested in early high-tech dynamos like Apple Computer, Intel, and Genentech.¹⁰¹ The increase in the capital gains rate in 1986, and the recession during the early 1990s, knocked the wind out of the venture capital market for a while. In recent years, the buoyant economy and the 1997 capital gains tax cut have fueled record high venture capital investments (see Figure 1).

One source of strength for the U.S. venture capital industry has been that investments from pension funds—the largest source of venture capital—are exempt from capital gains taxes. While reductions in capital gains tax rates do not directly affect this source of venture funds, capital gains tax rates are a determinant of taxable flows into venture capital funds. Additionally, capital gains taxes are a factor affecting other taxable private equity flows, such as entrepreneurs' own funds, and informal funds from angels whose investments are of a greater magnitude than venture capitalists.¹⁰²

Interestingly, a recent study by two Harvard economists, Paul Gompers and Josh Lerner, concludes that venture capital commitments by tax-exempt investors *are* indirectly sensitive to capital gains tax rates.¹⁰³ They note that lower capital gains tax rates may induce more individuals to become entrepreneurs because most compensation for

⁹⁹ *Fostering Entrepreneurship*, OECD, p. 76.

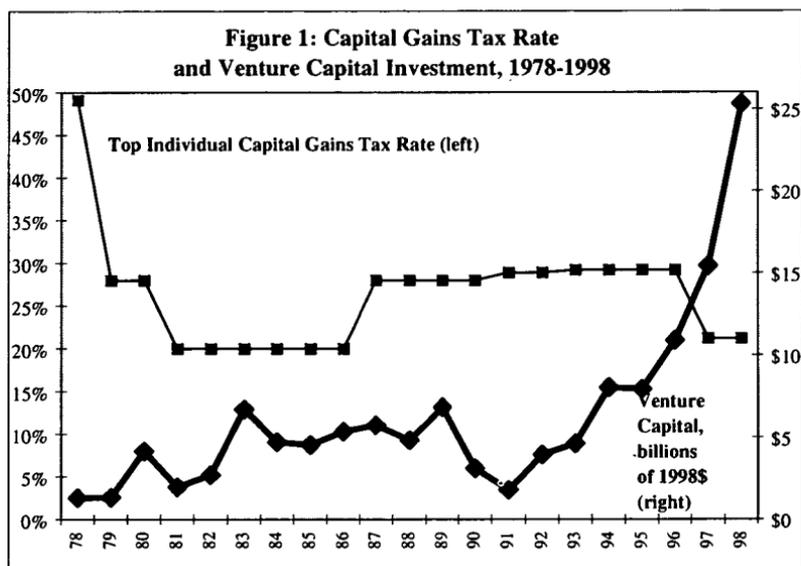
¹⁰⁰ Effective tax rates on capital gains from *The Labyrinth of Capital Gains Tax Policy: A Guide For the Perplexed*, Leonard E. Burman, 1999.

¹⁰¹ *The Economics of the Private Equity Market*, Federal Reserve Board Staff Report, December 1995.

¹⁰² *Fostering Entrepreneurship*, OECD, 1998, p. 77.

¹⁰³ "What Drives Venture Capital Fundraising," Paul Gompers and Josh Lerner, NBER Working Paper 6906, January 1999.

entrepreneurs, particularly in high-tech, is in the form of capital gains. This increases the demand for venture capital from both taxable and tax-exempt sources. The author's statistical analysis concludes that venture capital is sensitive to the capital gains tax rate, deregulation of pension investment restrictions, the GDP growth rate, and R&D expenditures by industry and universities.



Source: JEC, based on NVCA data.

According to NVCA figures, the United States raised *five times* more venture capital than Europe in 1998.¹⁰⁴ U.S. venture capital investments, or commitments, are \$25 billion compared to just \$5 billion for Europe. NVCA figures for a broader measure of private equity, which includes venture capital and buyout capital, totaled \$80 billion for the U.S. in 1998, which was four times larger than the comparable figure for Europe of just \$20 billion.

There are also significant differences in the nature of venture capital flows between the United States and Europe. A much higher percentage of venture capital is aimed at high-tech in the U.S than in Europe, and much less European venture capital goes towards risky early stage companies than in the U.S.¹⁰⁵

One problem for European high-tech may be that the more extensive government funding schemes sidetrack high-tech start-up companies by orienting them towards public money sources. If so,

¹⁰⁴ 1999 Yearbook, National Venture Capital Association.

¹⁰⁵ *Fostering Entrepreneurship*, OECD, 1998, p.254.

start-ups miss out on the guidance provided by angels and venture capitalists. One study found that in 1996, for example, 75 percent of external financing for new technology-based firms in France came from government funds, compared to just 9 percent in the United States.¹⁰⁶ A U.S. high-tech executive once noted that, "in the U.S. you go to a meeting in Chicago to present a plan to a wealthy group of potential shareholders; in Europe people spend their time seducing civil servants to get funding."¹⁰⁷

4. Public Equity Markets. While private equity works behind the scenes to fuel U.S. high-tech growth, initial public offerings (IPOs) and stock options are the high-profile side to high-tech financing. IPOs allow small high-tech firms to raise substantial amounts of funds for rapid and open-ended future growth.

Not only have IPOs raised billions of dollars for U.S. high-tech firms, the high volume of U.S. IPOs has led to increased private equity funding of start-ups because of the projected future benefits of going public. By contrast, in Europe one of the problems faced by the venture capital market is the lack of ability of investors to "exit" by going public. The shorter route to an IPO in the U.S. has helped entrepreneurs more easily raise venture capital money.

A central institution to U.S. high-tech success has been the NASDAQ, which was created as a market for young technology companies. Led by companies such as Microsoft, Intel, and MCI, NASDAQ now lists almost 5,000 firms, including over 90 percent of U.S. software companies and over 80 percent of U.S. computer manufacturers. The simpler and less costly listing requirements on NASDAQ have allowed high-tech firms to quickly raise money for expansion. As a recent *Washington Post* column noted,

To a large extent, the biotech industry is the legacy of NASDAQ—just as today's Net stocks probably could not exist if there were not a ready market for shares of companies that fall short of the stringent listing requirements of the New York Stock Exchange. Biotech financing also is a phenomenon that could only have been produced by the U.S. capital markets, with their diverse and democratized sources of funds.¹⁰⁸

¹⁰⁶ See *Technology, Productivity and Job Creation*, OECD, 1998. p.231.

¹⁰⁷ *Upside Today*, 1993, p.9.

¹⁰⁸ "From Biotech, a History Lesson for Internet Investors," Jerry Knight staff reporter, *Washington Post*, September 6, 1999.

The success of NASDAQ has spurred both Europe and Japan to try to copy it, but with limited success so far. This is a big handicap, because as the *Washington Post* notes, with the tougher stock listing requirements of a country like Japan, many well-known U.S. high-tech firms would have never gotten off the ground.¹⁰⁹

5. Stock Options. Many high-tech start-ups have a great idea and need experienced workers to move their vision ahead, but don't have the cash to pay them. For example, new biotechnology and Internet companies often don't generate much revenue, let alone profits, for perhaps years after start-up. But such firms need the skills of top-level computer programmers, scientists, and experienced business managers.

Stock options are a useful tool to attract these key knowledge workers to high-tech start-ups. In biotechnology, for example, over 80 percent of industry employees belong to a stock option plan.¹¹⁰ The *Washington Post* reports that more mid-level managers are eschewing the stability of large businesses, and being lured to small high-tech firms with the potential of a big stock option payoff.¹¹¹ Some Silicon Valley start-ups are even paying suppliers with stock options because they are so cash-short.¹¹²

The *Economist* has noted the importance of stock options to U.S. high-tech success: "Silicon Valley...is built on options, not just for the bosses, but for most of the staff. Some would even argue that America's uniquely generous use of options may explain America's uniquely successful economy."¹¹³ Compare this to the U.K., which has less favorable tax treatment of stock options—small, cash-poor tech companies are finding it difficult to attract top talent, according to the magazine.¹¹⁴

3. DIVERSITY

A. A Million Experiments

America's leadership position in high-tech owes much to the diversity of its businesses, entrepreneurs, and research labs which

¹⁰⁹ "From Biotech, a History Lesson for Internet Investors," Jerry Knight staff reporter, *Washington Post*, September 6, 1999

¹¹⁰ "Some Facts About Biotechnology," Web site of BIO at <www.bio.org>.

¹¹¹ *The Washington Post*, August 2, 1999.

¹¹² "Sweet Equity," *Wall Street Journal*, September 2, 1999.

¹¹³ *Economist*, August 7, 1999.

¹¹⁴ *Economist*, August 7, 1999, p. 46.

generate multiple and competing technological visions. The generation of diversity is an often-unheralded strength of market economies. The *Economist* says that it favors free markets "because a million experiments are safer than one big plan handed down by the Chief Engineer; markets weed out mistakes rather than entrenching them; their solutions to economic problems are always provisional, always adapting."¹¹⁵

The "Chief Engineer" approach used to be favored by many high-tech pundits who thought that the best technology strategy was to pick particular firms, industries, or standards for special treatment and subsidy. But the lack of knowledge about the future path of high-tech markets and technology is pervasive, thus making picking winners a losing strategy. As noted in Section 2.C., many of the diagnoses and prescriptions recommended for U.S. high-tech in the 1980s have turned out to be wrong, and sometimes counterproductive.¹¹⁶

Luckily, the Chief Engineer approach has been utilized less often in the United States than in Europe and Japan. In a new National Research Council report, innovation expert Professor David Mowery contrasts the "pluralistic" American approach to innovation, with the top-down approach of Europe and Japan:

Previous large-scale regional European programs of 'strategic-technology' R&D in information technology have failed to prevent the decline of large segments of the European information technology industry. Recent Japanese initiatives, such as the Fifth Generation computer technology program that sparked a hysterical reaction in the United States, as well as other collaborative efforts in software technology, have had little effect on the competitive fortunes of Japanese electronics and computer firms. Many European programs have been hampered by cumbersome and inflexible administrative structures, as well as continuing pressure to distribute R&D funds among EU member states in some equitable fashion. In addition, regulatory, trade, and competition policies within EU member states often have insulated domestic firms from competition, reducing pressure to

¹¹⁵ *Economist*, July 31, 1999.

¹¹⁶ "America's Industrial Resurgence: How Strong, How Durable?," David Mowery in *Issues in Science and Technology*, Spring 1999.

adopt and implement the results of these R&D programs more rapidly.¹¹⁷

European governments have funded an alphabet soup of high-tech initiatives, such as EUREKA, ESPRIT, MONITOR, RACE, and SPRINT, in a generally unsuccessful effort to catch up to the United States.¹¹⁸ The poor performance of such “strategic” policies leads the *Economist* to caution governments against spending money on the next Big Thing.¹¹⁹ The magazine notes that Japan “now unofficially admits that they are a waste of time.”

The U.S. approach has been to generate a “million experiments” from its diverse range of businesses and R&D labs. This approach makes sense because technology creates new frontiers with huge uncertainties—no one knows which technologies will end up being the most profitable. In e-commerce, new ideas and “business models” are being tested constantly on the Internet, with consumers the ultimate arbiters of the best approach. Diversity is the market solution for uncertainty—consumer uncertainty, economic uncertainty, and technological uncertainty.

High-tech financing operates on the diversity principle as well. Venture capitalists diversify their investments because a rough rule says that 10 percent of a venture firm’s portfolio of companies will provide 90 percent of the return.¹²⁰ Many investments fail or perform well below expectations. The *Wall Street Journal* notes that, “Wall Street firms freely admit that they do not know where all this [technology] will end up, so they are putting eggs in as many baskets as possible.”¹²¹

An interesting case study of the benefits of diversity is the rapid recovery of Silicon Valley from the tough Japanese competition in the 1980s. In semiconductors, the competition displaced one in five Silicon Valley workers. But the huge number of small and medium-size firms in Silicon Valley allowed it to pursue a multiplicity of responses to the Japanese challenge, and the industry quickly came back with a stream of higher-value, customized, and innovative

¹¹⁷ “The Global Environment of U.S. Science and Technology Policies,” David Mowery in *Harnessing Science and Technology for America’s Future*, National Research Council, 1999.

¹¹⁸ *The Economic Laws of Scientific Research*, Terence Kealey, 1996.

¹¹⁹ *Economist*, February 20, 1999. p.28.

¹²⁰ *Washington Post*, August 15, 1999.

¹²¹ *Wall Street Journal*, August 7, 1999.

computers and components that put it on top again.¹²² The U.S. company share of world semiconductor sales has risen from 37 percent in 1989 to 53 percent by 1998.¹²³

Like the composition of U.S. high-tech businesses and funding sources, the U.S. R&D effort is very complex and diverse. Rich networks of businesses, universities, government labs, and hundreds of partnerships and collaborations have played an important part in U.S. high-tech success. Most funding for basic research – research that may not have an immediate economic payoff – comes from federal spending. Most funding for market-oriented research comes from private industry. In 1998, the shares of total U.S. R&D funding were 65 percent for industry, 30 percent for the federal government, and 5 percent for universities and other institutions.¹²⁴

The types of companies doing industrial R&D are getting more diverse. The share funded by non-manufacturing industries has grown from 8 percent in 1987, to 24 percent by 1997. Also, the share of R&D being funded by small and medium-size companies (those with less than 25,000 employees) has grown from 45 percent in 1987, to 60 percent by 1997.¹²⁵ Thus, R&D decision-making is becoming more decentralized, allowing the economy to pursue many different approaches to technology challenges.

The diversity of the American R&D effort is complemented by the effectiveness of its implementation. Innovation experts are finding that it is not just the dollars spent on invention that is important; so is the efficient and rapid diffusion of inventions.¹²⁶ The *Economist* suggests that, “rather than trying to back winners in the laboratory, governments may be better off encouraging downstream industries to take full advantage of innovations.”¹²⁷ American industry has done this successfully as a result of its open and flexible markets, and high levels of entrepreneurship.

One important reform that helped spur quick adoption was the Bayh-Dole Act of 1980, which gave universities greater incentives to commercialize technology. The Act allowed universities to patent the

¹²² *Fostering Entrepreneurship*, OECD, 1998. p.94.

¹²³ Semiconductor Industry Association Web page at <www.semichips.org>

¹²⁴ *Science and Engineering Indicators*, National Science Foundation, 1998.

¹²⁵ *Research and Development in Industry*, National Science Foundation, 1998.

¹²⁶ “The Global Environment of U.S. Science and Technology Policies,” David Mowery in *Harnessing Science and Technology for America’s Future*, National Research Council, 1999. p.84.

¹²⁷ *Economist*, February 20, 1999. p.28.

results of federally funded research and license the resulting technology to businesses and other entities. By contrast, in some OECD countries government-funded researchers have restrictions on engaging in research that has commercial applications, and on cooperation with the business sector.¹²⁸

Numerous areas of federal policy can affect the speed of adoption of new technologies. For example, the rapid obsolescence of many new technologies is sometimes not reflected in the depreciation rules of the federal income tax code, thus creating disincentives to upgrade equipment. Semiconductor manufacturing equipment must be written off over five years, but rapid changes in this industry means that the equipment often becomes obsolete in three years. One study found that the United States lags behind some other industrial countries in terms of competitive depreciation treatment for technology equipment.¹²⁹

Open international trade and investment policies are also very important because technology embodied in imports generates domestic economic growth. The share of total G-7 country R&D performed by the United States has fallen from about 70 percent in 1960, to 48 percent today. Therefore, while there is great diversity of ideas in the United States, there are many inventions created outside the U.S. that U.S. companies need to adopt and exploit. In fact, an important reason why multinational corporations have steadily increased their foreign presence is to tap into foreign innovations. As the OECD notes, foreign R&D and technology has a major impact on domestic productivity in advanced economies.¹³⁰ As a result, U.S. policy should encourage liberalized international investment flows so that domestic industries learn and adopt the ideas and “best practices” of their competitors around the globe.

B. America’s Diverse and Efficient Knowledge Workers

It is sometimes claimed that there are benefits to cultural homogeneity for an economy. Similar consumers allow for large production runs at factories, thus creating lower average costs. Additionally, business communications are easier with people of a

¹²⁸ *OECD Observer*, OECD, Summer 1999.

¹²⁹ Testimony by the American Council for Capital Formation before the Senate Budget Committee, January 20, 1999. The Treasury Department is currently conducting an extensive study of depreciation periods and methods to be completed in 2000.

¹³⁰ *Technology, Productivity, and Job Creation*, OECD, 1998, p. 48.

similar language and culture. Some economists believe that Japan's cultural homogeneity was an economic strength up until the 1980s.

However, in the new entrepreneurial economy, homogeneity appears to be more of a liability than an asset. Computerization has increased manufacturing flexibility, thus lowering the costs of producing products for a wide variety of tastes. As the economy becomes more knowledge-based, a diversity of ideas generated by a diverse population is an engine of innovation and growth.

Individuals from different backgrounds are more likely to have differing experiences and sources of information. Immigrants will be familiar with the cultural factors important for marketing a U.S. product abroad, and immigrants may bring with them novel business ideas that are not yet adopted in the United States. As a result, America's population diversity—fed by an individualistic culture and inflows of immigration—appears to be an important strength in today's knowledge economy.

By contrast, commentators believe that part of the trouble with Japan's economy today can be attributed to "suppressing individuality; encouraging group behavior and conformity," as noted by the *Economist*.¹³¹ The *Washington Post* expressed a similar view about Japan: "business and government leaders fret that the educational system, with its emphasis on discipline and communal harmony, fails to turn out graduates with the creative skills and entrepreneurial drive animating the founders of Silicon Valley."¹³²

Helping to spur Silicon Valley's creative and entrepreneurial spirit has been waves of immigration. About one-third of scientists and engineers in Silicon Valley are foreign born. As the CEO of software firm Adobe notes, Silicon Valley high-tech firms are "rainbow coalitions" of people with diverse backgrounds.¹³³

Foreign-born workers don't just fill U.S. high-tech jobs; they create them. Some of the largest high-tech firms, such as Intel and Sun Microsystems, were founded by immigrants, as were more recent start-ups such as Hotmail. In fact, a recent study by the Public Policy Institute of California found that a remarkable 24 percent of Silicon Valley high-tech firms started since 1980 are run by Chinese and Indian immigrants.¹³⁴

¹³¹ *Economist*, February 13, 1999.

¹³² *Washington Post*, August 16, 1999.

¹³³ *Harnessing Science and Technology for America's Future*, National Research Council, 1999. p.123.

¹³⁴ The study by Anna Lee Saxenian is forthcoming by the Public Policy Institute of California. See the *Wall Street Journal*, June 25, 1999.

Immigrant groups often bring unique entrepreneurial skills to bear on business start-ups. Joel Kotkin finds, for example, that Korean and Middle Eastern immigrants have particularly strong propensities to start businesses.¹³⁵ Many source countries of immigrants have particularly strong trading traditions or work ethics. Additionally, immigrant companies may have an advantage in the global marketplace because their ties to home countries can be both a source of financing, and a market for U.S. export sales.

In addition to workforce diversity, a strength of the U.S. entrepreneurial economy appears to be the efficiency with which it utilizes knowledge workers. Less entrepreneurial economies have higher unemployment, thus wasting the skills of trained people. For example, OECD data for university-educated people aged 25-29 shows that just 3 percent are unemployed in the U.S., compared to 14 percent unemployed in France and 31 percent in Italy.¹³⁶ A country like France, which has a large government sector, may also inefficiently siphon off skilled workers from productive private employment, to less productive civil service positions.

A similar question of efficiency arises with respect to the deployment of R&D scientists. United States and Japan lead the world in terms of the number of R&D employees as a percentage of the labor force.¹³⁷ But the more highly mobile U.S. labor force may create a more efficient usage. The *Economist* notes that Japanese firms are behind their U.S. counterparts in joining the wired world because "they cannot turn to a plethora of small domestic third-party systems houses and software boutiques such as those that have helped corporate America to embrace the Internet. Although Japan has no shortage of talented software engineers, most work for large electronic firms, not independent start-ups."¹³⁸

4. CONCLUSION

The success of the U.S. high-tech sector illustrates America's mutually reinforcing strengths of entrepreneurship, open markets, and diversity. Entrepreneurs have flooded into open and competitive high-tech industries because of the huge opportunities and rewards available to successful innovators. Diverse sources of financial and human

¹³⁵ "Welcome To the Casbah," Joel Kotkin in *The American Enterprise*, January 1999.

¹³⁶ *Education at a Glance*, OECD, 1998. p.256.

¹³⁷ *Human Capital Investment*, OECD, 1998.

¹³⁸ *Economist*, August 7, 1999.

capital have ensured that good ideas don't get overlooked, and that many paths to innovation are pursued.

No strategic plan was responsible for the success of U.S. high-tech industries such as semiconductors, software, and biotechnology. Rather, decentralized decision-making in technology and capital markets has allowed many good ideas to be tested and developed. Diverse angel and venture capital funding, and efficient public equity markets, have allowed entrepreneurs to quickly grow business start-ups into multibillion-dollar enterprises.

A virtuous circle of wealth creation has fueled growth in U.S. high-tech as successful entrepreneurs recycle their income and expertise into new start-ups. Public policy can promote the virtuous circle by encouraging business start-up activity, and by minimizing disincentives to equity investment in risky entrepreneurial ventures. Countries with labor market rigidities, barriers to competition, high tax rates, and heavily regulated financial markets have not had the explosion of high-tech growth that the United States has enjoyed.

One important factor in U.S. high-tech success has been the efficiency with which innovation inputs are employed. High levels of entrepreneurship and competition ensure that R&D, education, and investment capital are used to maximum advantage. For example, some industrial countries have high savings rates, but inefficient financial systems, with the result that young high-tech companies don't get the financing that they need for expansion. Similarly, the benefits of R&D and education investments are not maximized in countries that have a shortage of entrepreneurs to turn inventions into innovations that grow the economy.

Other advanced economies will, no doubt, make gains in many high-tech industries as globalization continues to increase competition and the diffusion of technological know-how. The challenge for U.S. policymakers is to keep the United States one step ahead by reducing barriers to entry in product markets, encouraging further financial market innovation, and removing barriers to entrepreneurship.

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**Entrepreneurs
Creating the New
Economy**

November 2000

**Joint Economic
Committee
Office of the Chairman,
Senator Connie Mack**

EXECUTIVE SUMMARY

The Entrepreneurial Economy. The “new economy” is based on rapid growth in high-tech industries and on new technologies reshaping manufacturing, finance, medicine, and other sectors. Entrepreneurs are the main force behind these revolutionary changes because they start the companies that create new technologies and they harness new technologies to improve performance across the economy. The new economy is an entrepreneurial economy.

Creating New Industries. Entrepreneurs have created whole new industries by experimenting in market niches neglected by established firms. New firms were crucial to in-electricity, the internal combustion engine, automobiles, aircraft, electronics, petroleum, plastics, and more recently personal computers, biotechnology, and the Internet.

Tackling Uncertainty. In today's fast-moving economy, technological and market uncertainty are pervasive. Established companies or government agencies are not able to implement detailed plans to secure our economic future. Instead, the economy needs a diversity of established and new firms pursuing competing strategies and responding flexibly to changing conditions.

Generating Competition. New business formation provides a fundamental competitive check in the economy. In many industries, competition has intensified as new firms have been fueled by the rapid expansion of the venture capital, high-yield bond, and initial public offering markets.

Acting as the Economy's Guinea Pigs. The creative actions of entrepreneurs provide new and valuable knowledge. Entrepreneurs with radical new products or production processes are often doubted. However, the success of innovative firms shows that entrepreneurs continue to make breakthroughs by taking bold and untried new paths.

Turning Inventions into Innovations. Entrepreneurs are the link between inventions and markets. They connect new products to consumer needs through trial and error. This role may be more important to economic growth than the initial generation of inventions. It may also be harder, because entrepreneurs often face restrictions, monopolies, and other barriers to introducing new products.

New Horizons. Many formerly stagnant and monopolized industries have been opened up and transformed by entrepreneurs in recent decades. Building on this experience, policymakers may want to consider whether entrepreneurs could add value to industries still operated as monopolies, such as postal delivery and the public school system. If permitted to experiment, entrepreneurs may discover many yet unknown innovations to improve quality and efficiency.

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1. INTRODUCTION

America's robust economic expansion and booming technology sector are creating a "new economy." The new economy is based on rapid growth in high-tech industries and on high-tech industries reshaping the rest of the economy. High-tech gurus say that "the Internet changes everything." Indeed, computers and the Internet are spurring big changes in manufacturing, trade, finance, medicine, scientific research, and many other fields.

Entrepreneurs are the main force behind these revolutionary changes. Entrepreneurs start the companies that create new technologies and they harness new technologies to cut costs and improve quality in every industry from book sales to scrap steel trading. The new economy is an entrepreneurial economy.

Established businesses are responding to the intense competition from new entrepreneurial companies with restructuring efforts and large technology investments. However, in recent decades new companies have time and again caught established firms off guard. Young and fast-growing "gazelle" companies, such as Cisco, Amazon, Sun, Qualcomm, and Yahoo have been the pioneers behind many new products and industries. The competitive playing field has been leveled between new firms and large, established firms that were once thought to hold all the advantages.

From the introduction of its personal computer in 1982, IBM seemed destined for long-term domination of the PC market. But IBM would be eclipsed by a new company, Compaq, founded in 1982 by a partnership of three computer industry managers.¹ The new company raised \$87 million from the venture capital and stock markets, enabling it to quickly compete on a large scale. Compaq's innovative computer allowed it to earn \$111 million in first-year sales—a U.S. business record. Compaq eclipsed IBM in personal computer sales in 1993, and became the world's largest PC maker in 1995.² This sort of bold challenge, and rapid growth fueled by plentiful risk capital, is the mark of the new entrepreneurial economy.

Success stories like Compaq's have put entrepreneurs on the front page of every magazine, spurred thousands of Americans to launch start-ups, and stimulated new interest in academia about the economic

¹ *The Origin and Evolution of New Businesses*, Amar Bhide (2000), p. xiv. See also Compaq and Compaq Canada websites. Compaq's founders were Rod Canion, Jim Harris, and Bill Murto. The company raised \$20 million in venture capital and \$67 million from an IPO.

² In the United States, Dell Computer has now overtaken Compaq in sales.

role of entrepreneurs. There are now hundreds of professors specializing in entrepreneurship in the nation's business schools, and student interest has soared.³ College graduates have been eschewing Wall Street and big corporations to instead launch or join small high-tech start-ups.⁴

New business creation is at high levels. Americans start as many as two million or more new businesses each year, up from 600,000 a year in the mid 1970s. While most will remain small mom-and-pop operations, a small share of start-ups will grow into titans. These gazelle companies are exceptionally important to the economy. One study found that these firms represent just 4 percent of U.S. companies, but create 60 percent of all new jobs.⁵

Young entrepreneurial companies have been aided in their competitive challenges by advances in technology and by revolutions in U.S. financial markets. Cheaper and faster computers, sophisticated software, and the Internet have allowed smaller ventures to gain the information advantages once held by large firms. Financial market innovations in recent decades have ensured that large pools of capital are available to risk-taking entrepreneurs. The venture capital, high-yield bond, and initial public offering (IPO) markets have funneled billions of dollars to new ventures allowing them to test new ideas and challenge entrenched firms.

In addition, high levels of uncertainty in today's fast-moving economy have opened windows of opportunity for entrepreneurs. Technology and markets often take unexpected turns to which established companies are unable to adapt. High levels of uncertainty have also been a bane for governments and gurus who once believed that they could successfully plan our economic future. The big technology strategies that were popular a decade ago have been given up as hopeless in the face of fast-moving and unpredictable markets. At the same time, the 1990s boom has highlighted the role of entrepreneurs in tackling uncertainty with diverse competitive strategies. A recent article in the *Harvard Business Review* noted:

³ Bhide (2000), p. xiii. Professorships in entrepreneurship have risen from 18 in 1980 to more than 200 today. Regarding rising student interest, see "The Faces of a New Generation," *Wall Street Journal*, May 22, 2000. See also Arnold Cooper, "Entrepreneurship: The Past, Present, and Future," Purdue University.

⁴ Timmons (1999), p. 13. Recent stock market fluctuations may, of course, temper this trend.

⁵ Bhide (2000), p. 13.

...[the] road ahead is [not] without potholes and sharp curves. Some of the fastest, shiniest companies in today's economy may very well crash...But that is what the new economy is all about—companies attacking the status quo and entrenched players, and experimenting to find new technologies that improve or replace earlier ones.⁶

This report discusses how entrepreneurs create economic growth by testing new ideas, tackling uncertainty, challenging established firms, and growing small market niches into new industries. Section 2 examines new venture creation and the role of the financial markets in supporting entrepreneurial companies; Section 3 looks at the prevalence of uncertainty in the modern economy; Section 4 examines how entrepreneurs generate economic renewal and growth; Section 5 discusses entrepreneurial waves and the role of entrepreneurs in public policy change; and Section 6 provides the study's conclusions.

2. THE RISE OF THE ENTREPRENEURIAL ECONOMY

A. New Venture Creation

Every society has entrepreneurial individuals who continually pursue new and creative paths. In the economic world, the primary role of entrepreneurs is to establish and grow new business enterprises. New businesses inject novel ideas and products into society, generate competition to ensure high quality products and low prices, and create new jobs to replace jobs lost in declining industries.

The past few decades have seen a flourishing of new business creation. The author of the leading textbook on entrepreneurship, Professor Jeffrey Timmons, estimates that U.S. business start-ups have grown from perhaps 200,000 per year prior to the 1970s, to about 600,000 by the mid-1970s, to well over a million today.⁷ Figures from the National Federation of Independent Business show that there have been between 2.3 and 3.5 million new businesses launched in each of the past four years.⁸ These swarms of start-ups have transformed the

⁶ Sahlman (1999), p. 100.

⁷ Timmons (1999), p. 5.

⁸ William Dennis, Jr. for Wells Fargo/National Federation of Independent Business, *Business Starts and Stops*, January 2000. Figures from the NFIB and

U.S. economy, pushed the unemployment rate down to 30-year lows, revived many formerly decaying towns, and powered an 18-year boom (late 1982 to the present) with just 2 quarters of mild recession. In addition, the entrepreneurial boom has allowed millions of Americans to realize their dreams, as described by Professor Timmons:

Classical entrepreneurship means new venture creation. But it is much more...it is arguably the single most powerful force to create economic and social mobility. Because it is opportunity-centered and rewards only for talent and performance – and could not care less about religion, sex, skin color, social class, national origin, and the like – it enables people to pursue and realize their dreams, to falter and try again, and to seek opportunities that match who they are, what they want to be, and how and where they want to live.⁹

With the rise of the entrepreneurial economy in recent decades, conceptions of the business sector have changed. Attention used to focus on the distinction between *big* and *small* businesses: big businesses were thought to be stable and control the most important industries, whereas small businesses were thought to be less stable and less important. But there is growing recognition that a more useful distinction is between *established* firms and *new* firms. Attention has focused, in particular, on “gazelle” firms, which are young firms that grow into big firms very quickly, such Compaq or Cisco.

Gazelles are different from the millions of mom-and-pop businesses that start small and stay small. Gazelles grow big quickly, and often help create whole new industries. Economic historians Nathan Rosenberg and L. E. Birdzell note, “New enterprises, specializing in new technologies, were instrumental in the introduction of electricity, the internal-combustion engine, automobiles, aircraft, electronics, aluminum, petroleum, plastic materials, and many other advances.”¹⁰ That list can now be updated to include personal computers and PC software, the Internet, biotechnology, and other high-tech industries.

Jeffrey Timmons may not be directly comparable due to different methodologies used.

⁹ Timmons (1999), p. 5.

¹⁰ Rosenberg and Birdzell (1986), p. 277.

The United States has excelled at growing small firms into the new giants of leading-edge industries.¹¹ Efficient financial institutions, a huge domestic market, and the willingness of entrepreneurs to think big have allowed the United States to sprout thousands of gazelle companies. For example, start-up Cellular One beat giant Nynex and others in the emerging cellular telephone industry in the 1980s, and built a \$100 million business in five years, with no advantages other than entrepreneurial skill and smart marketing.¹²

This sort of success has been repeated many times in recent decades. The economic dynamism it is creating can be seen in the rapid turnover of the largest publicly traded firms. For example, just 11 of the top 25 U.S. firms by market capitalization in 1989 remained in the top 25 by 1999.¹³ Many of the newcomers to the top 25, such as Microsoft, Oracle, and Dell, have been led by determined entrepreneurs who are now among the wealthiest Americans. As a result, the American rags-to-riches success story is more common than ever. Research on America's millionaires has found that about 80 percent are self-made, while just 20 percent live off of inherited wealth.¹⁴ Similarly, about 80 percent of *Forbes* magazine's 400 richest people built their wealth rather than inheriting it.¹⁵

The technology boom is generating great interest in entrepreneurship. The share of college students who are interested in starting businesses is up sharply.¹⁶ Top university graduates have flocked to high-tech start-ups rather than big corporations, although recent stock market turbulence may temper this trend.¹⁷ And as corporate America has restructured, many laid off managers have taken the opportunity to start new firms.¹⁸

As has been widely documented, the information technology revolution has leveled the playing field between large, established firms and new firms. Many Internet start-ups have successfully challenged older bricks-and-mortar companies. As a leading venture capitalist recently noted, "The Internet has lowered the barriers to

¹¹ See U.S. Senate (1999) for a discussion of America's lead in high-tech.

¹² Timmons (1999), pp. 8-81.

¹³ "From GM to Cisco in Just Four Decades," *Business Week*, February 7, 2000.

¹⁴ Thomas Stanley and William Danko, *The Millionaire Next Door*, 1996.

¹⁵ *Forbes*, October 9, 2000, p. 362. Some 66% of the Forbes 400 wealthiest Americans are entirely self-made, 15% built their fortune with some inherited wealth, and 19% inherited their wealth.

¹⁶ *Frontier* monthly supplement, *Business Week*, December 6, 1999.

¹⁷ Sahlman (1999), p. 105.

¹⁸ Timmons (1999), p. 6.

entrepreneurship and democratized it for a wider populace.”¹⁹ The Internet provides everyone access to vast amounts of scientific, technological, and economic data. And as *Inc* magazine points out, the amount of information available on how to start and grow new businesses has increased greatly as well.²⁰ Even before the Internet, the PC revolution was already handing power to entrepreneurs. In the 1980s, PC database software, spreadsheets, word processing, and desktop publishing allowed small firms the tools they needed to compete with big firms.

Technology has become an entrepreneur’s best friend in research and development (R&D)-based industries with the advent of more powerful and less expensive computers, lab equipment, software, and other tools. Since 1990, the share of the nation’s industrial R&D spending by the largest companies (those with over 25,000 employees) has declined from 65 percent to 43 percent, as smaller company R&D has grown.²¹ Empirical research has found an increased share of innovation coming from small firms in recent decades,²² and some evidence indicates that the productivity of R&D is higher in small firms than large firms.²³

Another factor that has made small firms more competitive is the rise in collaborative R&D between firms, and between firms and universities. A recent report by the OECD notes that such networking allows small firms “to combine the advantages of smaller scale and greater flexibility with economies of scale and scope.”²⁴ Jay Walker, founder of Priceline.com, has summarized this trend:

[T]oday and in the future, the Information Network will make the centralization of information and research far less relevant. For all information will be available on the network, readily commanded by individuals and companies of every type. Armed with fast, cheap, ubiquitous computing, process, and communications power, innovation will increasingly

¹⁹ Steve Jurvetson, “From the Ground Floor,” *Red Herring*, April, 2000.

²⁰ 20th Anniversary Issue, *Inc*, 1999, p. 76.

²¹ National Science Foundation data for total U.S. industrial R&D at <www.nsf.gov>.

²² *The Economics of Industrial Innovation*, Chris Freeman and Luc Soete (1997), p. 239.

²³ See Freeman and Soete (1997), p. 233. See also Timmons (1999), pp. 9, 81; and Thomas Petzinger, *The New Pioneers*, (1999), p. 21.

²⁴ “Small and Medium Size Enterprises: Local Strength, Global Reach,” OECD (2000). See also Freeman and Soete (1997), p. 225.

emerge not from a small number of large corporate entities, government agencies, and centralized research centers, but from individuals and much smaller organizations.²⁵

B. Financial Innovation

The current high-tech boom has highlighted the vital link between entrepreneurs and the nation's capital markets. In a familiar story, promising young start-ups are sought out by venture capitalists and nourished with cash and management expertise. For firms that show promise of fast growth, public equity markets are tapped with an initial public offering (IPO) to raise more cash. Top talent is attracted with stock options and the firm is set for rapid expansion.

While the Internet frenzy has sped up this process, U.S. financial markets have a long history of funneling risk capital to entrepreneurial firms. Well-known inventors in prior centuries often teamed with wealthy financiers who could cover early losses during experimentation and fund quick expansion when bringing inventions to market.²⁶ For example, a century ago J. P. Morgan provided seed capital for Thomas Edison's Edison Electric Illuminating Co. Edison's speculative new business would expand to later become General Electric.²⁷ Risk capital was integral to financing the railroad and telegraph booms of the 1800s, and the radio, electricity, and automobile booms of the early 20th century.²⁸ So, risk capital is certainly not new, but the vastly greater volume and efficiency of today's financial markets allow many more potential Edisons to be funded.

The high-tech boom has been fueled by innovations in both the debt and equity markets. On the debt side, high-yield bonds played a key role in the 1980s in financing rapid growth in computers, semiconductors, telecommunications, and other industries. One estimate found that high-yield bonds financed 80 percent of the computer industry's expansion in the late 1980s.²⁹ The decade's most famous bond salesman, Michael Milken, raised over \$90 billion to

²⁵ Testimony of Jay Walker, Chairman of Walker Digital Corporation and founder, Priceline.com, before the Joint Economic Committee, June 6, 2000.

²⁶ Thomas Hughes, *American Genesis*, (1989), p. 83. See also Freeman and Soete (1997), p. 50.

²⁷ "M&A Century: Same As It Ever Was," *Wall Street Journal*, December 31, 1999.

²⁸ *The Entrepreneurial Adventure*, Larry Schweikart (2000), p. 318.

²⁹ Schweikart (2000), p. 491.

finance expansion at MCI, McCaw Cellular, Viacom, Tele-Communications Inc. (TCI), Time Warner, Cablevision, News Corp., CNN, and hundreds of other growth firms.³⁰ Many of these companies could not have raised the large sums of money needed for expansion anywhere else.³¹ Entrepreneurs like Craig McCaw of McCaw Cellular used debt to make large upfront investments in the hopes that the risks would be rewarded with big payoffs down the road.³² *Business Week* noted that McCaw was “ridiculed” in the 1980s for making such big early investments in cell phones, but the market subsequently exploded and McCaw became the largest cell phone operator in the country.³³

In a 1991 book on the high-yield bond industry, Glenn Yago describes how these instruments “created access to capital for small and medium-size companies that had been economically disenfranchised from participating in the capital markets.”³⁴ Yago notes that “investment-grade” debt securities could only be issued by about five percent of the nation’s largest publicly traded corporations. Most small and medium-size corporations relied on high-priced and more volatile bank loans and equity finance, putting them at a significant funding disadvantage to big corporations. The growth in the high-yield bond market went a long way towards putting smaller companies on an equal competitive footing. The *Wall Street Journal* recently noted that enthusiasm for high-yield bonds is now spreading to Europe and Japan because it creates “the democratization of capital...allowing little people to compete with the big guys regardless of bond rating, nationality, or size.”³⁵

Consider Wall Street’s role in backing the company that helped revolutionize U.S. telecommunications markets—MCI. Risk-taking venture investors put up tens of millions of dollars to back MCI in a decade of legal struggles with AT&T in the 1970s. With the court-ordered break-up of AT&T in the early 1980s, MCI was on the cusp of a major expansion. Drexel Burnham Lambert helped MCI raise \$2 billion in a high-yield bond issue in 1983.³⁶ With this infusion of cash, MCI could now build a nationwide fiber optic network and drive down

³⁰ *Junk Bonds*, Glenn Yago (1991), p. 25.

³¹ Schweikart (2000), p. 514.

³² “McCaw Comes Calling Again,” *Puget Sound Business Journal*, September 23, 1996.

³³ “Craig McCaw: The Prophet of Telecom,” *Business Week*, September 28, 1998.

³⁴ Yago (1991).

³⁵ “Global Markets, Following U.S., Acquire Taste for Junk,” *Wall Street Journal*, August 14, 2000.

³⁶ Schweikart (2000), p. 487.

the cost of long-distance phone service.³⁷ Michael Milken could have been describing MCI when he noted that high-yield bonds “allow entrepreneurs outside the system to get capital to realize their dreams.”³⁸

In addition to financing young growth companies, high-yield bonds have played a key role in remaking America’s large, established corporations into a more entrepreneurial mold. In the early 1970s, a group at Bear Stearns led by Jerome Kohlberg experimented with a new technique of using high-yield debt to finance buyouts of poorly performing companies. The purpose was to install new management and improve performance for shareholders. A leveraged buyout (LBO) by Kohlberg’s group in 1972 showed how the technique would work. Bear Stearns teamed with managers of a division of Singer Co. who believed they could run the division better as an independent company. Bear Stearns put up \$4.4 million and raised \$33.5 million in debt to acquire the division, then installed the new management to make the needed changes.

Kohlberg, along with Henry Kravis and George Roberts, formed KKR in 1976 to specialize in such deals. KKR realized that many of the nation’s diversified conglomerates would generate more value to the economy if they were split up and run separately. But KKR needed investment funds to realize their plans. Their timing was right, as they were able to tap into newly liberalized pension fund money in the late 1970s, and new high-yield bond financing structures pioneered by Drexel Burnham Lambert. With these new sources of capital, KKR and others jump-started the corporate restructuring boom of the 1980s.

The corporate shake-ups spurred by the LBO movement were controversial because some deals were bitterly fought, and some companies failed to climb out of a mountain of debt. But LBOs, and broader efforts to make corporate management more accountable, created widespread ripple effects on the economy. Managers in every corporation were forced to improve performance to avoid becoming the next takeover target. *Forbes* noted of the 1980s, “attitudes in American business across the board had been changed by 2,385 leveraged buyouts worth a total of \$245 billion....These deals helped revolutionize corporate finance, create new incentives for efficient management, and inspire risk-taking on a grand scale.”³⁹

In the 1990s, a second front of entrepreneurial financing blossomed with the explosion of the venture capital (VC) industry in

³⁷ *Forbes Greatest Business Stories of All Time*, Daniel Gross editor (1996), pp. 290, 295.

³⁸ Yago (1991), p. 25.

³⁹ *Forbes* (1996), p. 330.

Silicon Valley. This industry fed \$48 billion of equity risk capital to young technology companies in 1999, up from just \$3 billion in 1990. Since the 1970s, many of the dynamos of the U.S. high-tech industry were nourished with VC investment, including Apple, Lotus, Compaq, Intel, Yahoo, Sun, Genentech, Cisco, and Amazon.⁴⁰

Like the debt-market innovators of the 1980s, VC financiers started out small and honed their craft over time with experimentation. They faced many unknowns that could only be answered with trial and error: How should VC investment vehicles be structured to limit risks? How many failed companies can be sustained for each winner? When should money-losing companies be folded? When should companies be brought public? Today, the VC industry is continuing to evolve. Attempts to speed the start-up process have led to the development of over 350 business “incubators” and “accelerators” such as idealab! and CMGI.⁴¹ These entities co-locate a group of start-up firms together to share accounting, marketing, legal, and strategy expertise, so that entrepreneurs can stay focused on company-building.⁴² Time will tell whether this assembly line approach to entrepreneurship will work.

Other innovations include experiments by some venture funds to open up investment pools to ordinary investors. Typically, only institutional investors and wealthy individuals took part in VC funding for various reasons, including regulatory roadblocks.⁴³ If these experiments are successful, it should further increase the flow of money to leading edge firms in the economy.⁴⁴ As the flood of investment capital into venture funds increases, the nature of VC funds may also evolve since what worked when the industry was small may not work so well when it is big.⁴⁵ Again, only time will tell.

The success of financial markets in funding America's entrepreneurial boom is summed up by a recent *Harvard Business Review* piece that noted, “Money in this country flows toward big dreams.”⁴⁶ Those big dreams, and access to cash, will continue to fuel competitive challenges, the development of new industries, and the generation of growth and renewal in the economy.

⁴⁰ Bhidé (2000), pp. 161, 163. See also Timmons (1999), p. 9.

⁴¹ “Money to Burn,” *The Economist*, May 27, 2000. Also see Shannon Henry, “The Faster Factor,” *Washington Post*, August 17, 2000.

⁴² Leslie Walker, *Washington Post*, March 2, 2000. See also *The Economist*, May 27 and August 12, 2000.

⁴³ “Smash the Venture Cartel,” *Forbes*, January 10, 2000.

⁴⁴ “Venture Capital Fund Aims at Ordinary Investor,” *Washington Post*, December 8, 1999. See also “Money to Burn,” *The Economist*, May 27, 2000.

⁴⁵ “Adventurous Venture Capital,” *The Economist*, May 27, 2000.

⁴⁶ Sahlman (1999), p. 105.

3. UNCERTAINTY AND THE LIMITS TO PLANNING

The growth of the economy during the past two centuries has been characterized by many dead ends, bankruptcies, disappeared industries, and failed prognostications. Professor Richard Nelson summarizes what we are up against in planning for the future:

The batting average of scientists and engineers, economists, government officials, and businessmen in predicting the most important future technological events has been abysmal. Experts very often are wrong both in what they predict will happen, and in what they predict won't happen.⁴⁷

Consider the track record of experts in macroeconomic projections. *Business Week's* annual outlook poll in December 1998 concluded that, "In uncommon unity, forecasters from all around the country expect growth to slow, perhaps substantially."⁴⁸ The magazine found that, on average, 55 leading economists predicted that real GDP growth in 1999 would be 1.9 percent. As it turned out, 1999 was a banner year with growth coming in at 5.0 percent. *Business Week's* surveyed experts made the same mistake the year before by predicting real growth of 2.3 percent for 1998. Actual 1998 growth came in at 4.6 percent.⁴⁹

Projections regarding particular markets or technologies have been no better. History is full of examples of new technologies that were at first greatly over or underestimated, such as the telegraph, telephone, and personal computer.⁵⁰ Innovation expert Clayton Christensen concludes that we "can always count on one anchor: experts' forecasts will always be wrong."⁵¹ Today, the economy is more dynamic and unpredictable than ever due to deregulation, globalization, and the information technology revolution. These forces have eroded the ability of experts to make predictions, and eroded the ability of

⁴⁷ Nelson (1996), p. 33.

⁴⁸ "The New Year's Bundle of Jitters," *Business Week*, December 28, 1998.

⁴⁹ "And For the Economy's Next Act," *Business Week*, December 29, 1997.

Figures for 1998 and 1999 are measured from fourth quarter to fourth quarter.

⁵⁰ For example, Alexander Graham Bell's telephone was initially considered to be a toy by Western Union's president. See Schweikart (2000), p. 320.

⁵¹ Christensen (1997), p. 158.

governments and big corporations to control the pace or direction of economic change.

This is the type of environment that entrepreneurs thrive in. High levels of uncertainty tend to give the edge to small and new companies.⁵² This is not because they can prognosticate any better than large firms. In fact, studies have not found any correlation between start-up success and prior extensive planning.⁵³ Instead, the small-firm advantage is the ability to change direction quickly as markets change, and the sheer numbers of small firms means that some will succeed even if many fail. Small-firm flexibility is exemplified by the fast-changing Internet industry, where businesses “launch and learn” rather than adhering to long-range strategies. A good example is the launch of Netscape in 1994. Netscape made the early decision to give away its Navigator Web browser for free. Where would Netscape’s revenues come from? The company founders thought that they would figure that out later.⁵⁴

The following sections underscore the fact that neither businesses, governments, nor gurus can plan our economic future very accurately. Past errors in judging technology and markets are cataloged. As discussed later in the report, this great uncertainty is a fundamental reason why the economy needs a diversity of entrepreneurs to tackle every new opportunity. No company or expert will always get it right.

A. Business Plans and Predictions

Interactive Television. Before consumers embraced the Internet by the millions, technology pundits and big companies were betting on “interactive TV,” which would feed movies and other services to home TV sets on demand. In the early 1990s, Time Warner and others invested hundreds of millions of dollars developing and installing prototypes in test communities.⁵⁵ But the explosion of the World Wide Web in 1994 and 1995 made it suddenly clear that this approach was all wrong. It turned out that the information superhighway would be based on PCs, not TV sets. In a rapid about-face, every big player changed direction—Microsoft famously realized the importance of the Internet all of a sudden in 1995, and quickly moved 1,000 programmers into Internet projects.

⁵² Bhide (2000), p. 17.

⁵³ Bhide (2000), p. 60.

⁵⁴ *The Silicon Boys*, David Kaplan (1999), p. 239.

⁵⁵ Lewis (2000), pp. 76-82. See also Kaplan (1999), p. 233; and see “Click Flicks,” *Forbes*, August 7, 2000.

HDTV. A few years before interactive TV, high-definition television (HDTV) was the big new thing. In 1992, the *Journal of Commerce* reported, "Businessmen and scientists believe that HDTV...will be the invention that drives the next major technological revolution, creating an explosion of consumer demand to fund a generation of industrial growth and innovation."⁵⁶ Almost a decade later, that revolution still has not happened.

Iridium. As the cell phone industry was taking off, \$5 billion and 10 years of work were pumped into developing a satellite-based phone system, Iridium, that could be accessed worldwide. Iridium was backed by a leading technology company, Motorola, and the complex technology for the system was successfully developed. However, the market for the expensive phone system did not materialize as expected. Iridium filed for bankruptcy in 1999, and pulled the plug on its network in March 2000, after operating less than two years.⁵⁷

Satellite TV. Unlike Iridium's satellite phone experience, satellite TV has been very successful—to the surprise of many pundits who didn't think it made sense. The *New York Times* reports that people had originally joked that Hughes' DirecTV DBS system stood for "Don't Be Stupid."⁵⁸ But now Hughes's satellite system has eight million viewers, making it larger than all but two of the nation's cable TV systems.

Computers. Huge under- and overestimates have plagued the computer industry since its inception. In the 1950s, IBM developed computers for military and scientific applications, but totally discounted possible business applications.⁵⁹ As it turned out, its first "Model T" computer, the 650, sold nine times more units than projected as businesses snapped up the machines for payroll accounting and other uses IBM had overlooked.⁶⁰

On the other hand, IBM and other mainframe manufacturers missed out on the later mini-computer market, which became populated by new firms such as Data General and Digital Equipment Corporation (DEC). Then in turn, both the mainframe and minicomputer makers overlooked the PC market, which was pioneered

⁵⁶ "Bush to Invoke Content Rules for HDTV Development," *Journal of Commerce*, June 29, 1992.

⁵⁷ "Iridium Loses Its White Knight," *Washington Post*, March 4, 2000. See also "Iridium Satellite Network to Flame Out," Reuters newswire, March 18, 2000.

⁵⁸ *New York Times*, February 28, 2000. See also *Investors Business Daily*, June 6, 2000.

⁵⁹ Freeman and Soete (1997), p. 176.

⁶⁰ Freeman and Soete (1997), pp. 173, 174.

by start-ups such as Apple.⁶¹ Ken Olsen, founder of DEC, in 1977 noted, "There is no reason for any individual to have a computer in their home."⁶² Then in the 1980s, new firms, such as Compaq and Sun, pioneered the markets for portable computers and engineering workstations, respectively. Finally in the 1990s, Dell eclipsed Compaq in the U.S. PC market by use of a new business model: Internet sales. Similarly, the computer games market was missed by all the existing computer firms, and instead pioneered by Atari in the early 1970s. Atari's founder, Nolan Bushnell, remembers, "People thought the idea of playing games on a television set was the stupidest idea they'd ever heard of."⁶³

Synthetic Leather. After its huge success with Nylon, Dupont spent \$100 million in the 1950s and 1960s developing and marketing a synthetic leather substitute. Thorough research, trials, and market studies were completed, and a product was launched with a big advertising campaign. But the product failed and was eventually withdrawn from the market.⁶⁴

RCA's VideoDisc. RCA introduced a videodisc player in 1981 with projections that sales would rise into the billions of dollars as the machine substituted for the VCR. Unfortunately, the product was a flop, and the company lost over half a billion dollars by 1986.⁶⁵

Other Misjudgments. There are many other famous misjudgments by leading businesspeople. Edison had that thought battery cars were the future.⁶⁶ Bill Gates in 1981 thought that, "640K [of computer memory] ought to be enough for anyone." And IBM's chairman in 1943 opined, "I think there is a world market for maybe five computers." The *Economist* cites the U.S. Patent Commissioner stating in 1899 that, "Everything that can be invented has been invented," and notes that, "History is littered with such foolish predictions about technology."⁶⁷

Based on their study of two centuries of industrial innovations, professors Chris Freeman and Luc Soete think that projections for new products are often wildly over- or underestimated, and no company is immune to big blunders.⁶⁸ They note, "The power of the giant

⁶¹ Christensen (1997), pp. 108, 109.

⁶² Timmons (1999), p. 84. See also Saxenian (1994), p. 100.

⁶³ Kaplan (1999), p. 89.

⁶⁴ Freeman and Soete (1997), p. 127.

⁶⁵ Schweikart (2000), p. 494.

⁶⁶ Timmons (1999), p. 84.

⁶⁷ "Survey of the New Economy," *The Economist*, September 23, 2000.

⁶⁸ Freeman and Soete (1997), p. 242.

corporation should not be exaggerated...it is clear that many attempted innovations fail in large firms as well as small firms.”

Such failures are often fatal and the graveyard of once high-flying technology companies is very large. All is not lost to the economy though. Workers from failed companies take their knowledge to newer companies, and the best innovations will be borrowed by surviving firms like successful adaptations in an ecosystem.

B. Insights of the Policy Gurus

If technology companies cannot accurately project the future, it seems unlikely that policy gurus can do any better. However, that doesn't stop the gurus from trying, as illustrated by some of the bad advice given to the U.S. high-tech industry over the years. Such misjudgments can lead to public policy that overreaches the government's abilities, and locks the economy into faulty and wasteful outcomes.

Too Many Entrepreneurs. A decade ago, many leading gurus concluded that Japan's government “planning” had put its economy in the lead. They also thought that the United States had too many entrepreneurs following different plans, rather than one overall national strategy. In 1988, *Time* magazine reported, “many scholars and business leaders...are beginning to voice concern about what Harvard economist Robert Reich has dubbed ‘chronic entrepreneurialism’.”⁶⁹ *Time* went on to note, “They blame the proliferation of small companies for an alarming loss of U.S. market share in strategic high-tech industries, ranging from semiconductors to fiber optics. The constant sprouting of new ventures, they explain, may be weakening the U.S. industrial structure by splintering American manufacturing power into too many small pieces.”⁷⁰ Today, it is clear that these concerns were widely off target. But some pundits don't give up, and have recently been lamenting that there is now too much venture capital.⁷¹

More Planning Needed. More technology “planning” seemed to make sense to many in the 1980s and early 1990s. In 1992, former chairman of the Council of Economic Advisors, Laura Tyson, noted,

⁶⁹ “Big vs. Small: Is Entrepreneurialism Hurting the U.S. by Splintering its Industrial Base,” *Time*, September 5, 1988.

⁷⁰ Lester Thurow expressed similarly that the U.S. may have “too much entrepreneurship.” See his 1992 book *Head to Head*. Other pessimists on entrepreneurship cited by *Time* included Clyde Prestowitz (see his 1988 book *Trading Places*) and Charles Ferguson of MIT.

⁷¹ “Smash the Venture Cartel,” *Forbes*, January 10, 2000.

"We must not be hoodwinked by the soothing notion that the fate of America's high-technology industries will be determined by market forces."⁷²

Such sentiments were common.⁷³ A major 1989 study by the blue-ribbon MIT Commission on Industrial Productivity captured the optimism regarding government technology planning: "[The Japanese semiconductor] business is coordinated by the government to minimize wasteful duplication of effort..."⁷⁴ By contrast, the U.S. needs "structural rationalization" for its "existing inefficient system" of production.⁷⁵ But during the 1990s, the U.S. high-tech industry surged as a result of individual entrepreneurial efforts, and Japan has had a decade of slow growth.

U.S. High-Tech Sector Too Fragmented. The 1989 MIT report lamented the "fragmentation" of the U.S. semiconductor industry compared to the more "rationalized" Japanese industry.⁷⁶ The report found that "a pattern of instability, high mobility, and new-venture formation has characterized the young American merchant [semiconductor] industry in the past 20 years." By contrast, "The Japanese semiconductor industry was far more stable," which is "more important than ever."⁷⁷ Similar criticisms were aimed at the U.S. computer hard-drive industry.⁷⁸

Again, the experts were exactly wrong. Diversity and "fragmentation" were the keys to the remarkable resilience and continuing rapid growth of Silicon Valley, as documented in Annalee Saxenian's excellent 1994 study of the region.⁷⁹ While the U.S. semiconductor industry did face heavy competition in the 1980s, its

⁷² "Whatever You Call It, Industrial Policy is on the Way," *Business Week*, December 28, 1992. Tyson described herself as a "cautious activist" regarding government policy to maintain America's competitiveness in high-tech. See her *Who's Bashing Whom: Trade Conflict in High-Technology Industries* (1992).

⁷³ Other prominent advocates for some sort of industrial policy during the 1980s and early 1990s included Chalmers Johnson, Robert Reich, Ira Magaziner, Kevin Phillips, H. Ross Perot, Clyde Prestowitz, and Lester Thurow.

⁷⁴ MIT Commission on Industrial Productivity (1989), p. 260.

⁷⁵ MIT Commission (1989), p. 261.

⁷⁶ MIT Commission (1989). See comments by Saxenian (1994) pgs. 6, 44, 111.

⁷⁷ MIT Commission (1989), pp. 64, 255. See comments by Saxenian (1994) pp. 6, 44, 111.

⁷⁸ Saxenian (1994), p. 193, footnote 5.

⁷⁹ Saxenian (1994). See also Schweikart (2000), p. 526.

share of the world market has risen from 37 percent in 1989 to 51 percent today.⁸⁰

Short Time Horizons. It used to be widely claimed by economic gurus that long time horizons were another key to Japanese success. The 1989 MIT report criticized the “short time horizons” of U.S. businesses and their “bias toward quick profit.”⁸¹ Wall Street’s efforts to pressure corporations to maximize short-term performance was widely criticized. Pundits claimed that the Asian and Continental European models of interlocking corporate ownerships gave companies more room for long-term planning. Prominent economics guru Lester Thurow thought it was a good thing that in Japan and Germany, “Business groups insulate management from short-term stock market pressures.”⁸²

But today, America’s supposed vices like short corporate time horizons sound more like virtues, notes economist Paul Krugman.⁸³ The Asian and European business models had major flaws and have been exposed as “crony capitalism.” These countries are now moving towards American-style corporate structures.⁸⁴ Long-term planning is out, and the rapid exploitation of new ideas is in, as companies today compete in “Internet time.”

Lifetime Employment Policies. A decade ago, many experts were promoting Japanese-style “lifetime employment” policies as a key to economic success. Lester Thurow thought that America’s compensation policies should be changed to “dramatically cut turnover rates” and reduce job-hopping by business managers.⁸⁵ The 1989 MIT report thought that Japanese employment policies gave them the edge: “Independent venture formation and mass defections are almost nonexistent in the Japanese semiconductor industry.”⁸⁶ It suggested that “Policies should encourage structural rationalization, less personnel turnover, and more training,” and that subsidies be given to companies to “encourage long-term employment.”⁸⁷

⁸⁰ Semiconductor Industry Association web page at <www.semichips.org>.

⁸¹ MIT Commission (1989), pgs. 55, 57. Also, for example, a major Harvard Business School / Council on Competitiveness study called “Time Horizons” looked into this issue and issued a report in 1992.

⁸² Lester Thurow, *Head to Head* (1992), p. 281, 288.

⁸³ Paul Krugman in *Fortune*, March 6, 2000, p. F18.

⁸⁴ For example, see “Nissan’s Revival,” *OECD Observer*, April 2000.

⁸⁵ , Lester Thurow, *The Zero Sum Solution* (New York: Simon and Schuster, 1985), pp. 162, 163, 125. See also Thurow’s *Head to Head* (1992), p. 139.

⁸⁶ MIT Commission (1989), p. 260.

⁸⁷ MIT Commission (1989), p. 261.

Once again these prescriptions appear to have been exactly wrong. With lifetime employment, Silicon Valley would simply not exist, because it was built by job-hopping engineers founding start-ups, often with borrowed ideas that prior employers weren't interested in. Job-hopping has led to the rapid diffusion of new ideas in Silicon Valley.⁸⁸ Consider Larry Ellison, who moved from firm to firm in Silicon Valley in the 1970s waiting to seize an opportunity. He found it in the late 1970s in IBM's idea for relational database software. Since IBM wasn't pursuing the idea, Ellison founded Oracle to pioneer database software, and has grown it into the world's second-largest software firm today.⁸⁹

The Silicon Valley tradition of job-hopping engineers began with the exodus from Shockley Semiconductor in 1957, which included Gordon Moore and Robert Noyce. Moore and Noyce went on to lead Fairchild Semiconductor and grow it into a dominant Silicon Valley firm in the 1960s, before jumping ship again to found Intel in 1968. Fairchild was such a great incubator of future engineer-entrepreneurs that at least 100 Valley companies were founded by these "Fairchildren."⁹⁰ Similar patterns are found in other high-tech industries, including scientific instruments⁹¹ and disk drives.⁹² Silicon Valley has twice the job mobility rate of the U.S. economy as a whole.⁹³

These types of bad policy calls in the past have now made most economic gurus more cautious about promoting big strategic plans.⁹⁴ Governments, as well, have been humbled by their failed white elephant technology projects, and by their inability to effectively carry out strategic planning. While governments do need to get the basics right in areas such as education and tax policy, there is simply too much uncertainty for detailed strategic planning to be done effectively, as the following section illustrates.

C. Government Strategic Planning

MITI. Japan's technology planning agency, MITI (the Ministry of International Trade and Industry), used to be held out as a model of

⁸⁸ Saxenian (1994), p. 37.

⁸⁹ Kaplan (1999), pgs. 119-145.

⁹⁰ Kaplan (1999), p. 58.

⁹¹ Freeman and Soete (1997), p. 129

⁹² Christensen (1997), p. 45.

⁹³ National Commission on Entrepreneurship (2000).

⁹⁴ See "What Happened to the Asian Miracle," *Investors Business Daily*, October 29, 1999.

farsightedness in industrial policy. Lester Thurow, for example, thought that “Japan Inc needs to be met with USA Inc” because “major investment decisions have become too important to be left to the private market alone.”⁹⁵

But, as now widely documented, MITI’s crystal ball was never any better than anyone else’s. For example, MITI advised Honda to stick to motorcycles and not diversify into cars; it encouraged over-investment in steel and aluminum; its heralded “fifth generation” computing initiative in the 1980s was a failure;⁹⁶ it discouraged Akio Morita, founder of Sony, from licensing transistor technology from the United States in the early 1950s;⁹⁷ and in the 1960s, it mistakenly advised the car industry to consolidate.⁹⁸

If MITI wasn’t so great at “planning,” what explains Japan’s industrial success up until the 1980s? Japan succeeded because of high levels of competition and entrepreneurship, not industrial policy, as George Gilder and others have noted.⁹⁹ Many Japanese industries, including automobiles, motorcycles, steel, robotics, and consumer electronics had high numbers of firms leading to a diversity of strategies and intense domestic competition.¹⁰⁰ By the 1990s, the failure of industrial planning had led even MITI to change its focus, and it now promotes deregulation rather than centralized planning.¹⁰¹

Antitrust. Many economists support antitrust policy because it has theoretical appeal and seems to make sense in the static world of paper calculations. But antitrust’s Achilles heel is that the real economy is highly dynamic, thus often making government solutions obsolete before the legal ink has dried. Consider the antitrust case against Xerox in the early 1970s. After inventing the first modern photocopier in 1960, Xerox Corporation led the industry it created for the next decade, and still held an 86 percent market share in the early 1970s. In 1973, the Federal Trade Commission charged Xerox with illegally monopolizing the copier business. A two-year struggle with the FTC costing millions of dollars ended in a settlement. As it turned out, the government’s intervention proved to be unneeded as IBM, Eastman-

⁹⁵ Entry on “Industrial Policy” in the *Fortune Encyclopedia of Economics*, 1993.

⁹⁶ Saxenian (1994), p. 204. See also *New Scientist*, May 2, 1992.

⁹⁷ Akio Morita obituary in the *Financial Times*, October 4, 1999. See also *New Scientist*, May 2, 1992.

⁹⁸ Lester Thurow, *The Zero Sum Solution* (New York: Simon and Schuster, 1985), p. 285. See also Freeman and Soete (1997), p. 154.

⁹⁹ See Gilder’s *The Spirit of Enterprise* and other books.

¹⁰⁰ Schweikart (2000), p. 526. See also *The Economist*, April 10, 1999, p. 19.

¹⁰¹ “MITI Cuts Japan Loose,” *Management Today*, January, 1995.

Kodak, Canon, Minolta, Ricoh and others surged into the market in the mid-1970s with often superior products. As new competitors arrived and Xerox's management energy was drained by litigation, its market share was eroded to just 54 percent by 1978, and continued to fall.¹⁰² Dynamism in the economy also made redundant other high-profile antitrust cases such as the federal government's 1969-1982 losing case against IBM's mainframe computer business. The case cost hundreds of millions of dollars, generated 66 million pages of evidence, sapped IBM's management resources, and ended up after 13 years with the government conceding that its case was without merit.¹⁰³

Alternative Fuel Cars. A recent example of misjudgment in technology policy appears to be the current administration's efforts to spur development of alternative fuel cars with over \$1 billion of financial support to national labs and U.S. automakers. The *New York Times* has reported that while U.S. carmakers are far from introducing a marketable product, Japanese producers already have such vehicles that they developed with little government funding.¹⁰⁴ U.S. makers have focused attention on diesel hybrid engines, which so far appear to have been a poor choice compared to the gasoline hybrids the Japanese companies have opted for.

Big Technology Projects. While the U.S. government has been more restrained than other governments in pursuing big civilian technology projects, it has pumped money into its share of white elephants. During the 1960s, the U.S. and European governments each spent billions of dollars developing competing supersonic passenger airplanes. The U.S. program was cancelled in the early 1970s, but the European Concorde did not succeed as planned either. The *Financial Times* recently noted that the Concorde was too expensive, far over budget, too cramped, too noisy, and ended up being a \$13 billion taxpayer subsidy to the wealthy.¹⁰⁵ Other white elephant projects in the

¹⁰² *Forbes* (1996). See also Schweikart (2000), p. 538. Xerox's general counsel at the time noted regarding the FTC, "We were telling them about the Japanese and what was coming with increased competition, but they wouldn't listen. They were purists. If you had market share you were evil." Quoted in Gary Jacobson and John Hillkirk, *Xerox: American Samurai* (New York: Macmillan, 1986), p. 72.

¹⁰³ Gary Anthes, "What Microsoft Could Learn from U.S. vs. IBM," *Computerworld*, March 2, 1998.

¹⁰⁴ "Detroit Plays Catch Up in Race for Hybrid Car," *New York Times*, January 1, 2000.

¹⁰⁵ "Flights of Folly," *Financial Times*, August 17, 2000. The figure of 9 billion British pounds is converted to U.S. dollars. See also Freeman and Soete (1997), p. 250.

U.S. include many in the energy field, such as the \$2 billion wasted from 1970-1984 trying to produce synthetic fuel from coal.¹⁰⁶

D. Even Successes Are Often Not Planned

While economic plans and predictions often fail, even successes are frequently not fully expected. For example, some of Japan's management innovations were more chance developments than far-sighted policies. Professor Nelson notes that Japan's just-in-time manufacturing innovations originally stemmed from space shortages in factories; only later were they found to also facilitate quality control.¹⁰⁷ Another example is Henry Ford's famously high worker pay. It is often claimed that this policy stemmed from an enlightened and far-sighted social policy by Ford. In fact, the policy stemmed from unanticipated high factory turnover, which reached 400 percent, when Ford introduced his moving assembly line.¹⁰⁸ Ford discovered that he had to pay high wages to retain skilled workers so that his new system would work.

Some successful entrepreneurs admit that they never expected their innovations to have such a big impact. The co-founder of Adobe Systems, Dr. John Warnock, has noted, "Those of us who started the desktop computer and software revolution almost 20 years ago had no idea what an impact our ideas would have on the economy and society."¹⁰⁹ In Adobe's case, "we imagined that one day if we were successful, we might employ around 40 people...fortunately for us, our rather modest business plan did not work out the way we had predicted." Today, Adobe is the third largest PC software company in the U.S., with revenues of \$1 billion and a workforce of 2,600 people.

E. Implications

The last few sections documented how businesses, governments, and experts can all seriously misjudge the future course of technology and markets. How then should the economy be organized to deal with such ubiquitous misjudgment and failure? The balance of the report describes how an entrepreneurial economy succeeds by generating a diversity of new and growing firms to experiment and compete,

¹⁰⁶ Jonathan Rauch, "The Visible Hand," the *National Journal*, July 9, 1994.

¹⁰⁷ Nelson (1996), p. 117.

¹⁰⁸ Schweikart (2000), p. 307. See also *Fortune*, November 22, 1999, p. 111; and Freeman and Soete (1997), pp. 144, 156.

¹⁰⁹ Testimony of Dr. Warnock before the Joint Economic Committee, June 6, 2000.

particularly in leading-edge industries where uncertainty is the greatest.

The venture capital industry illustrates one of the ways an entrepreneurial economy deals with uncertainty. One estimate found that about half of VC investments are write-offs.¹¹⁰ And only a few VC investments are big successes: just 7 percent of venture investments account for about 60 percent of profits, according to estimates.¹¹¹ VCs and their investors are able to take on risky projects by diversifying their portfolios and knowing when to cut losses. By contrast, large corporations are often not willing to try risky experiments, as discussed in later sections.¹¹²

In addition, smaller, entrepreneurial companies have a better ability to correct for misjudgments because of their greater flexibility. In fact, entrepreneurs typically change plans frequently after they launch start-ups.¹¹³ As a general rule, large corporations are not so flexible. As a result, smaller firms tend to populate highly uncertain markets, while large corporations tend to populate more stable industries, although other factors do come into play in determining industry structures. A continuum can be envisioned with entrepreneurial economies at one end structured around a diversity of nimble firms competing with flexible strategies.¹¹⁴ At the other end are government-led economies following overarching industrial strategies. Economies resembling the latter are much more vulnerable to unexpected events, and are slower to take advantage of growth opportunities when they arise, than are entrepreneurial economies.

Government policy can support the entrepreneurial economy by removing barriers to business start-ups and expansions, and by opening doors to competition in every industry. In addition, government itself should act in a stable and predictable manner so that entrepreneurs do not face political uncertainties on top of the uncertainties they face in the marketplace.¹¹⁵

¹¹⁰ Gary Hamel, "Bringing Silicon Valley Inside," *Harvard Business Review*, September-October 1999.

¹¹¹ Bhidé (2000), p. 145. See also Kaplan (1999), pp. 195, 196.

¹¹² Bhidé (2000), pp. 196-203, describes uncertainty and the types of investment opportunities pursued by large corporations, venture capitalists, and entrepreneurs.

¹¹³ Timmons (1999), p. 76.

¹¹⁴ See Bhidé (2000), pp. 196-203.

¹¹⁵ High inflation, crime, corruption, and other government failings raise risks for entrepreneurs substantially. Countries and regions with these problems see little new business investment. For example, a study by Shang-Jin Wei found that government corruption created great uncertainty for potential foreign

4. WHAT DO ENTREPRENEURS DO FOR THE ECONOMY?

A. Entrepreneurs in Economic Theory

The creative actions of entrepreneurs are central to economic growth, but entrepreneurs have received little attention from mainstream economic theory. Economics textbooks generally say little about the growth of small firms into the giant corporations of tomorrow. Professor William Baumol has noted that entrepreneurs did make “shadowy” appearances in 19th century economics, but these shadows largely disappeared in the 20th century.¹¹⁶

A principal reason for this disappearance is that much of modern economics focuses on mathematical abstractions within which entrepreneurial actions do not fit well. The central focus of mainstream, or “neoclassical,” theory is “general equilibrium.” In general equilibrium, the economy is at rest, no firm earns exceptional profits, labor and capital usage is optimized, and producers and consumers act with complete certainty. These elements are expressed in precise mathematical models that leave no room for the often anarchic and messy acts of entrepreneurs. By leaving out entrepreneurs, mainstream economics provides us with “an elaborate stage of theory, without a protagonist to animate the play,” notes George Gilder.¹¹⁷

business investors, creating a strikingly large and negative impact on inward foreign direct investment. (National Bureau of Economic Research Working Paper 6255, November 1997). A recent domestic example of how politics creates uncertainty for businesspeople is the drop in biotechnology share prices in May 2000 in response to adverse statements on the industry by President Clinton. After the plunge, one investment advisor noted, “I think this is a brilliant illustration of what happens when government policy changes suddenly....A critical component of technology innovation and business innovation is policy stability, not just in patent rights, but also in taxes, property rights, monetary policy and international trade.” Quoted in “Nasdaq Swoons After Plea; Point Drop is 2nd Biggest,” *Washington Post*, March 15, 2000.

¹¹⁶ Bhidé (2000), p. 5.

¹¹⁷ As quoted in a book review of Gilder's *The Spirit of Enterprise in Policy Review*, Heritage Foundation, Fall 1984.

The marginalization of entrepreneurship in economic theory causes problems when real world public policy issues are examined.¹¹⁸ On the one hand, mainstream theory provides accurate insights for simple policy issues, such as the effect of price controls on an industry. But it does a poor job explaining more complex issues, such as the causes of economic growth. This is because the chief “protagonist” of economic growth, the entrepreneur, has been left out.

By leaving out the entrepreneur, mainstream theory also biases public policy towards focusing on the market economy’s shortcomings, rather than its achievements. For example, theory posits that “market failures” occur when markets don’t live up to a textbook definition of perfection. In the idealized perfect economy, consumers and producers act like robots with perfect foresight and optimal decision-making. Alas, the real economy is plagued with uncertainty and people make many imperfect decisions. In such cases, theory suggests that the market has failed, and many economists presume that corrective government action becomes required.

Ironically, by leaving out entrepreneurs mainstream economic theory leaves out the problem solvers who tackle the very imperfections that theory has identified. For example, consumers do indeed lack perfect knowledge about many products, and as a result are sometimes fleeced in the marketplace. But entrepreneurs invent mechanisms to counter these problems such as brand names, warranties, insurance, and other devices. In recent years, Internet entrepreneurs have created a huge leap forward in consumer knowledge by providing online information about product pricing, quality, and safety.¹¹⁹

Numerous economists have recognized the shortcomings of mainstream economic theory, and devoted attention to the crucial role played by entrepreneurs. The following bullets highlight some of the views of various economic thinkers regarding the functions performed by entrepreneurs. Particular real-world entrepreneurs may be thought of as performing some combination of these functions.¹²⁰

¹¹⁸ See Nelson and Winter (1982) for a discussion of the shortcomings of orthodox economic theory.

¹¹⁹ See discussion in “A Thinker’s Guide,” *The Economist*, April 1, 2000. An interesting example of how entrepreneurs in the Internet world are solving problems is EBay’s efforts to reduce fraud to retain its reputation. See “EBay Changes How the Wild Web is Run,” *Washington Post*, November 28, 1999.

¹²⁰ This section borrows from discussion in Bhide (2000). See also the “Entrepreneurship” entry by Mark Casson in *The Fortune Encyclopedia of Economics* (1993).

Coordinate Production. Some economists, beginning with the Frenchman Jean-Baptiste Say 200 years ago, have described entrepreneurs as the coordinators of the factors of production. In this role, the entrepreneur rents the factory, hires labor, purchases inputs, and serves customers. The entrepreneur is the hub in the wheel of the economy's many interrelationships.

Create Market Equilibrium. Entrepreneurs may be thought of as the agents that move markets *toward* equilibrium. When an industry is not in equilibrium, high profit opportunities exist which attract attention from observant businesspeople. If, for example, the price of a commodity is higher in one city than another, an entrepreneur can arbitrage by shipping the commodity between places to close the price gap. As described by New York University professor Israel Kirzner and others, entrepreneurs are alert to such opportunities and take action to close such imbalances that they discover.¹²¹

Create Market Disequilibrium. A somewhat different role was envisaged by the early 20th-century Austrian economist Joseph Schumpeter, who saw the entrepreneur as initiating revolutionary changes that move the economy *away* from the current equilibrium.¹²² The entrepreneur provokes "creative destruction" by introducing new products, new management techniques, or new production processes to the economy. This disturbs economic stability, and moves the economy in a new direction. In this view, disruptive innovation is the entrepreneur's main role.¹²³

Bear Uncertainty. Many economists, building on the insights of the 18th-century financier Richard Cantillon, the 20th-century University of Chicago economist Frank Knight, and others, have stressed the entrepreneur's role in bearing uncertainty.¹²⁴ As this paper has noted, the modern economy is replete with technological and market uncertainties. While market institutions, such as insurance, take care of normal quantifiable risks, entrepreneurs must grapple with *unquantifiable* types of risks, such as introducing new products to

¹²¹ "Creativity and/or Alertness: A Reconsideration of the Schumpeterian Entrepreneur," Israel Kirzner, *Review of Austrian Economics*, v. 11, no. 1/2, 1999.

¹²² "Creativity and/or Alertness: A Reconsideration of the Schumpeterian Entrepreneur," Israel Kirzner, *Review of Austrian Economics*, v. 11, no. 1/2, 1999.

¹²³ Holcombe (1998), p. 56, reconciles this view with the Kirznerian view which sees the entrepreneur moving the economy toward equilibrium.

¹²⁴ "Entrepreneurship," Mark Casson in *The Fortune Encyclopedia of Economics* (1993).

markets. If successful, high profits are the reward that entrepreneurs earn for such beneficial activities that few people wish to undertake.¹²⁵

Act on Unique Knowledge. The entrepreneur's role can be understood by realizing that individuals have a very limited range of knowledge compared to the vast totality of information in the economy. As the Nobel Prize-winning economist F. A. Hayek stressed, information is dispersed widely so that each individual or business has a unique knowledge base gained from its own particular situation and experience. Entrepreneurs are those that act on such specialized knowledge, and earn a profit if it proves to be valuable. For example, an engineer who observes a new technique being used in one industry may adapt it for use in another. By doing so, she produces new information, causes market prices to readjust, and generates economic growth by creating something new and better.

Today, greater attention is being paid to the role of entrepreneurs because of the increasing focus on *dynamism* in the economy, in contrast to the *static* orientation of traditional economic theory. The new focus on dynamism is not surprising given the fast pace of change caused by the computer revolution, globalization, and other factors. Today's economy has been likened to an ecosystem that continually changes and evolves. A 1998 Small Business Administration report noted, "The U.S. economy is a dynamic organic entity."¹²⁶ This view has its roots in thinking by economists in the Austrian School and others outside the mainstream.¹²⁷ For example, Joseph Schumpeter noted, "The essential point to grasp is that in dealing with capitalism we are dealing with an evolutionary process."¹²⁸

Mainstream economic theory likens the economy to a mechanical device, which could seemingly be controlled and fine-tuned by a central authority to achieve optimal efficiency. Labor and capital are assumed to be undifferentiated inputs to production like gasoline in a car engine. By contrast, in the evolutionary view, growth comes from individual action, diversity, and experimentation. Successful experiments are copied and adopted widely to generate economic

¹²⁵ Frank Knight thought that profits stemmed from two sources: uncertainty and monopoly. See *Fortune*, March 6, 2000, p. F-43.

¹²⁶ *The New American Evolution: The Role and Impact of Small Firms*, Small Business Administration, June 1998.

¹²⁷ For a discussion of evolutionary economic theory, see Nelson and Winter (1982); or Horst Hanusch, editor, *Evolutionary Economics: An Application of Schumpeter's Ideas* (1988). Also of interest is "The Praxeological Entrepreneur vs the Promoter: An Assessment of Ludwig von Mises on Entrepreneurship," by Professor J. Patrick Gunning, August, 1998.

¹²⁸ Nelson (1996), p. 53.

growth. Entrepreneurial actions are at center of this evolutionary understanding of the economy.

The basic conception or model that is used to understand the workings of the economy is very important because public policy flows directly from this understanding. As Albert Einstein said, "Our theories determine what we measure."¹²⁹ As noted, placing too much weight on mainstream theory overemphasizes purported market failures, and ignores entrepreneurial solutions. Professor Richard Nelson has discussed why false theories can result in policymakers over-reaching their abilities:

In real capitalist economies, in contrast with the neoclassical models, technological advance proceeds through an evolutionary process, with new products and processes competing with one another in real time, rather than solely in ex-ante calculation. Some of the innovations will be winners, other losers. With the vision of hindsight the whole process looks messy and wasteful, and a more coherent planning approach to technological advance appears attractive.¹³⁰

Unfortunately, many policymakers have mistakenly believed that a "more coherent planning approach" to the economy can actually work. But as Section 3 illustrated, uncertainty is pervasive in the modern economy, and a centralized strategy to create growth is not feasible. Growth must be left to the entrepreneurs. Professors Nathan Rosenberg and L. E. Birdzell find that "The failures of planning can be attributed in part to its conception of an economic system as a lifeless machine, without the internal capacity to change, adapt, grow, renew, reproduce itself, and shape its own future."¹³¹ Entrepreneurs breathe life into the machine and create change, renewal, and growth.

B. How Entrepreneurs Create Economic Growth

i. Radical Innovators

Every industry experiences occasional upheavals caused by new technologies, new business models, and other innovations.¹³² The

¹²⁹ Quoted in Petzinger (1999), p. 18.

¹³⁰ Nelson (1996), p. 114.

¹³¹ Rosenberg and Birdzell (1986), p. 331.

¹³² Joseph Schumpeter identified five types of innovation: new products, new methods of production, new markets, new sources of supply, and new business models. See Nelson and Winter (1982), p. 277.

Internet explosion and the development of just-in-time manufacturing methods are examples of such changes.¹³³ These types of “disruptive” or “radical” innovations are usually unexpected, and greatly disturb existing producers and market relationships.

Economic studies have found that new entrepreneurial firms have been the source of most disruptive innovations in the economy.¹³⁴ A well-known example is the pioneering of personal computers by upstart Apple, which Professors Rosenberg and Birdzell note, “was not undertaken by any of the leading American computer manufacturers, nor by the Soviet Union, nor by the French Commissariat du Plan, nor by MITI in Japan.”¹³⁵ More recently, the pioneering of Internet retailing was undertaken by companies such as Amazon, and not by established bricks-and-mortar retailers.

By contrast, large, established companies are the main source of incremental or “sustaining” innovations, which improve technology and production efficiency in a more orderly manner. Intel's success at improving the speed and performance of microprocessors over three decades is a good example of sustaining innovation. Such improvements aim at steady improvement of known processes or products, and are certainly vital to economic growth. The huge R&D budgets of large technology companies typically aim at such sustaining innovations.

But established firms often overlook more radical innovations, as suggested by a long list of new products that were championed by new businesses. Professor Clayton Christensen examined this phenomena in his award-winning 1997 book, *The Innovator's Dilemma*.¹³⁶ Professor Christensen's study of the computer hard drive industry traces six major disruptions from the 1970s to the 1990s based on new size standards (14-inch, 8-inch, 5.25-inch, 3.5-inch, 2.5-inch, and 1.8-inch drives). During this period, the industry was highly dynamic- with over 100 firms entering and exiting. Each new disk drive size standard was generally overlooked by dominant firms and pioneered by new firms. Established firms created sustaining innovations within each size standard, but underestimated the potential of new disk sizes when they arose.

¹³³ Christensen (1997), pp. 37, 47. See also Bhide (2000), p. 227 for a discussion of management innovation.

¹³⁴ Freeman and Soete (1997), p. 234.

¹³⁵ Rosenberg and Birdzell (1986), p. 258.

¹³⁶ Christensen (1997). Note that Christensen distinguishes “radical” innovations from “disruptive” innovations. I have used the words interchangeably.

Christensen does not attribute the success of upstart companies to simply bad management on the part of large, established firms. Rather, large companies have subtle but powerful biases that result in their overlooking new opportunities. First, big new markets typically don't start big; instead, they usually start as small niches and tend to be ignored. Second, corporate managers are trained to stay close to existing customers and fill their needs, rather than pursuing markets that currently don't exist. Third, managers in stable, established companies favor familiar investments with seemingly predictable returns. New niche markets seem to promise lower and more uncertain returns.

In addition, big firms often harbor opposition to radical new ideas. After all, investments in new areas often mean shifting resources away from managers with existing customers. A 1999 *Harvard Business Review* article called large corporations "the last bastion of Soviet-style central planning" because new investment ideas often must go through numerous bureaucratic decision layers.¹³⁷ Unconventional ideas are out of luck in such a system. By contrast, the article noted that in entrepreneurial Silicon Valley, "there's no one person who can say no to a new idea. Power is diffuse, and there are many sources of capital."

In his book on American entrepreneurial history, Professor Larry Schweikart draws similar conclusions to Professor Christensen.¹³⁸ He notes that, "the established leader in an area is usually unlikely to pioneer the next major breakthrough." At the time of Alexander Graham Bell's invention of the telephone in 1876, Western Union dominated the telegraph market, and was in the best possible position to develop the telephone. But Western Union didn't invent the telephone, nor did it initially realize its potential. Western Union's president described the new device as a "toy" and initially rejected Bell's offer to sell him the patent rights.¹³⁹ Similar stories of the triumph of newcomers emerge in industries as diverse as the ocean-going ships, transistor radios, and heavy construction equipment.¹⁴⁰

The core of the problem for established firms is that radical innovations are essentially unplannable.¹⁴¹ Large firms miss unplannable opportunities because they usually focus on big, predictable markets with quantifiable payoffs. By contrast, start-ups

¹³⁷ Gary Hamel, "Bringing Silicon Valley Inside," *Harvard Business Review*, September-October 1999.

¹³⁸ Schweikart (2000).

¹³⁹ Schweikart (2000), p. 320.

¹⁴⁰ Christensen (1997), pp. 61, 75.

¹⁴¹ Freeman and Soete (1997), pp. 244, 255, 273.

generally don't pay much heed to sophisticated analyses of market projections and payoffs.¹⁴² In addition, small entrepreneurial firms simply have numbers on their side because many small firms pursue a multitude of paths, but the small number of big firms in an industry pursue just a few.

How important are "radical" innovations to the economy? Studies have found that about half of technology progress stems from new radical innovations, with the other half stemming from incremental or sustaining improvements.¹⁴³ The importance of new entrepreneurial companies is clear when one considers that perhaps 95 percent of radical innovations come from new companies, and not from big, established firms.¹⁴⁴

A classic story of a new firm rising to greatness on the basis of a radical innovation is Xerox Corporation.¹⁴⁵ Before Xerox introduced the first modern photocopier in 1960, businesses used messy and inefficient mimeograph machines to copy documents. In 1947, a small manufacturer of photographic papers, Haloid Corporation, found an independent tinkerer, Chester Carlson, who had through trial and error developed a process using chemicals and static electricity to reproduce images. Carlson had tried to convince leading companies, including IBM, Kodak, and 20 others, to back his invention, but was turned down by all of them before he was approached by Haloid. Haloid saw something in the crude process that the big business equipment companies at the time apparently didn't.

Carlson reached agreement with Haloid in 1946 and the team spent 14 years struggling to refine the process and register patents on their discoveries. With minimal earnings and only a distant and unsure promise of success, Haloid pumped \$75 million of borrowed money and proceeds from share issues into research. This was "venture capital" long before today's organized venture capital markets. Visionary leadership by Haloid's Joseph Wilson kept morale high, and he persuaded enough financial backers that this unproven technology would be the wave of the future.

After many failures and premature predictions of success, Haloid introduced its landmark model 914 in 1960. Haloid changed its name to Xerox in 1961 and would soon grow into a giant. Xerox realized that the machine's high price tag would be a barrier for many customers, so it developed an innovative leasing program to make the

¹⁴² Freeman and Soete (1997), pp. 244, 273.

¹⁴³ Christensen (1997), p. 56.

¹⁴⁴ Timmons (1999), pp. 9, 81.

¹⁴⁵ Based on discussion in *Forbes* (1996); MIT (1989), p. 271; and other accounts.

machine more affordable. The machine was a huge success and sales quickly soared into the hundreds of millions of dollars. Xerox's long years of experimentation and perseverance had led to the creation of not just a new product, but a whole new industry.

The triumph of Xerox and their radical innovation illustrates how crucial new entrepreneurial businesses are to the economy. The economy can't rest on the economic laurels of its current industry leaders because today's new businesses will be the Fortune 500 businesses of tomorrow.

ii. Growing Small Niches into Big Industries

Some of the biggest technology firms today, including Intel and Microsoft, started out in niche markets with specialized products.¹⁴⁶ Niche markets are like small fault lines of which some will develop into major earthquakes. But nobody knows for sure which fault line will become the next earthquake, so independent entrepreneurs have a good chance at beating the largest corporations if they take advantage of the niche opportunities available to them.

Bill Gates began his career by writing computer code for an obscure hobbyist computer called the MITS Altair in the mid-1970s. This would not have seemed like the path to the top of the computer industry at the time—it was a niche market (software) within a niche market (home computers). Instead, the mini and mainframe computer industries would have appeared to be the path to a successful technology career. Mainframe and minicomputer companies overlooked the microcomputer niche that outsiders like Gates were starting to explore.

Intel's central role in the remarkable growth of the microprocessor industry makes one forget that they also started out as a niche firm. Founded in 1968, Intel created the first dynamic random access memory, or DRAM, semiconductors. Before then, computer memory had been supplied by firms making magnetic core storage. One account of the industry noted, "Others in the industry predicted that they [DRAMs] would cost about ten times as much as magnetic cores. As a result, few firms saw any commercial possibilities in developing them."¹⁴⁷ But Intel did, and DRAMs quickly became the dominant storage medium. Intel then moved on to creating the world's first microprocessor, which put an entire central processing unit on a single chip. This chip, the 4004 introduced in 1971, followed by the 8080 in

¹⁴⁶ Bhide (2000), p. 148.

¹⁴⁷ *Forbes* (1996), p. 251.

1974, heralded the beginning of the modern computer age. But surprisingly, there was initially uncertainty regarding these new devices because it wasn't clear where the market for them would be.¹⁴⁸

Big firms often ignore small niche markets because they don't appear at first to be important enough to warrant attention. Professor Christensen notes that niches don't appear to solve the growth needs of big corporations because they aren't "large enough to be interesting."¹⁴⁹ Large corporations with aggressive growth goals instead tend to aim at markets that they believe will become very large. By contrast, small companies are more eager to explore small, experimental opportunities—only later does it become clear that some of these small opportunities mushroomed into big ones.

Another well-known story of an entrepreneurial company that grew an ignored niche into a huge market is Nucor's pioneering of the mini-mill steel industry.¹⁵⁰ Mini-mills make steel from scrap metal in electric arc furnaces, and they can reach high efficiencies with smaller output levels than the large integrated steel makers. Mini-mills have grown from nonexistence in the 1960s to over 40 percent of the U.S. steel market by the 1990s.¹⁵¹ These gains have been won by new firms such as Nucor, rather than the formerly dominant integrated producers, who had higher cost structures. While the integrated steel makers have made great strides in efficiency in recent decades, they tended to ignore the potential of mini-mills because they initially produced lower quality products. But since Nucor's first mini-mill in 1969, mini-mills continuously improved their quality and expanded into up-market steel products to win business from the integrated firms. Nucor also jumped on the new thin-slab casting process in the late 1980s before the integrated firms, who were more risk-averse.

The big role that small firms play in the economy is experimentation on the uncertain fringes of markets. For example, every business has by now jumped on the Internet bandwagon, but the real entrepreneurs took the big risks a decade ago when the rewards were very uncertain. As far back as the early 1980s, Steve Case, co-founder of America Online, was exploring the consumer potential of home computers interacting over the phone lines. In a recent biography of Case, the *Washington Post* noted that he "jumped on a once-screwball belief—that computers would become tools for mass

¹⁴⁸ Kaplan (1999), pp. 64-72.

¹⁴⁹ Christensen (1997).

¹⁵⁰ Schweikart (2000), pp. 456-458.

¹⁵¹ Christensen (1997), pp. 87-93.

communications.”¹⁵² Case turned that screwball belief into gold. He grew small Quantum Computer Services in 1985 into today’s AOL, which serves 25 million homes. Case’s AOL far outstripped what were then bigger competitor systems with deeper corporate pockets, including CompuServe and Prodigy, the latter backed by Sears Roebuck and IBM.

A recent study by PricewaterhouseCoopers found that big companies can be overly cautious in exploration of untested markets.¹⁵³ Their survey of senior executives of 800 large corporations found that most only go ahead with a new product if there is an estimated 80 percent chance of success. The study suggests that this is too high a threshold and companies get “analysis paralysis” in trying to predict unpredictable market outcomes. Professor Amar Bhide also describes some reasons why big companies overlook niches:

Large corporations tend to pursue initiatives with large initial investment requirements and low uncertainty...stringent evaluation and monitoring requirements encourage them to pursue a few large projects rather than many small ones. Multilevel evaluations of new initiatives also limit the uncertainty that corporations can tolerate.¹⁵⁴

Once smaller, entrepreneurial firms are up and running in niche markets, their flexibility and adaptability gives them an edge over large competitors.¹⁵⁵ For example, a Merrill Lynch analyst recently noted regarding Yahoo’s success, “Disney and others have tried very hard and put an extraordinary amount of effort into trying to create Internet properties as dominant as Yahoo and haven’t been able to do it.”¹⁵⁶ Once in a niche, further opportunities to grow will be quickly acted upon by the entrepreneur. For large firms, corporate checks and balances often require extensive planning for any changes in direction. So the value of corporate planning is reduced in volatile industries, such as high-tech, giving the leg up to smaller firms.¹⁵⁷ Professor

¹⁵² “From Suburban Roots to a Global Ambition,” *Washington Post*, June 4, 2000. AOL’s co-founder with Case was Jim Kimsey.

¹⁵³ “Companies Seen as Too Cautious on Innovation,” *Financial Times*, December 7, 1999.

¹⁵⁴ Bhide (2000), pp. 39, 197.

¹⁵⁵ Bhide (2000), p. 198.

¹⁵⁶ “Look at Roaring ‘20s Finds Optimistic Parallels,” *Wall Street Journal*, June 12, 2000.

¹⁵⁷ Bhide (2000), pp. 43, 131.

Bhide says this vulnerability is the “inevitable consequence of the separation of ownership and management” in big corporations.¹⁵⁸

Large corporations are increasingly recognizing their vulnerabilities. *The Economist* notes that the terror of small-firm innovation is one of the main drivers of today's acquisition boom.¹⁵⁹ For example, since 1993, Cisco has bought 51 companies for a total of \$15 billion.¹⁶⁰ Another response of big technology companies has been to set up their own venture capital funds. Intel, for example, has pumped \$2 billion into venture investments in the past decade.¹⁶¹

In summary, the roles of small and large, and new and established firms in the economy are complementary. Large firms can do many things better than small firms, such as investing huge amounts in R&D to create “sustaining” innovations. Smaller entrepreneurial companies are better suited to exploring the potential of niche markets to uncover the next radical innovation that will reshape the economy.

iii. Generating Competition

Whenever an industry provides poor service, charges high prices, or falls behind the times, an entrepreneur will see an opportunity to profit. New business formation by entrepreneurs provides a fundamental competitive check in a market economy. Professors Rosenberg and Birdzell note, “The easy formation of new enterprises also acts as a disciplinary device for older enterprises. The same human forces that produce bureaucratic rigidities in mature government agencies are also at work in mature economic enterprises, in both cases, opposing the forces that produce change and growth.”¹⁶²

An outstanding example is MCI's fight to introduce competition to long-distance telephone markets. By the 1960s, AT&T's long distance monopoly had lasted for half a century under a regulated industry structure. Prices were high, and the industry was slow to innovate. MCI's ultimate success forced prices down and spearheaded the rollout of fiber optic technology that AT&T had been slow to adopt.¹⁶³

In the late 1960s, a two-way radio salesman named John Goeken thought that microwave technology could be used to offer an alternative to AT&T's business-to-business long distance. To break

¹⁵⁸ Bhide (2000), p. 197.

¹⁵⁹ *The Economist*, December 4, 1999, p. 61.

¹⁶⁰ *Washington Post*, March 12, 2000.

¹⁶¹ “Money to Burn,” *The Economist*, May 27, 2000. See also *Wall Street Journal*, February 8, 2000, p. C1.

¹⁶² Rosenberg and Birdzell (1986), p. 277.

¹⁶³ Schweikart (2000), p. 486.

into AT&T's markets, Goeken realized he would need both a great deal of financial support and experts to help him fight for Federal Communications Commission (FCC) approvals. After a lengthy search, he convinced William McGowan, a self-made millionaire, to support his cause. MCI began a decade-long struggle to enter AT&T's long distance markets. The FCC allowed MCI partial entry in 1969, but McGowan kept pushing and launched an antitrust suit against AT&T in 1974. The federal government followed McGowan's lead and filed an antitrust suit later the same year. The two suits were eventually wound up in the early 1980s with the break-up of AT&T, and two decades of rapid innovative and price reductions in telecommunications have followed.

MCI needed what all entrepreneurs with big ideas need: plenty of far-sighted investors willing to take risks. The risks were great in MCI's case because of the regulatory uncertainty and seeming invincibility of Ma Bell. MCI racked up losses of \$76 million through the mid-70s, and at times its stock price plummeted to a fraction of its prior value. Venture capitalists plowed \$100 million into MCI, the company raised another \$30 million from a 1972 IPO, and tens of millions of dollars were raised from bank loans and private investors. In the early 1980s, \$2 billion was raised from a high-yield bond issue to complete a major expansion.¹⁶⁴ As described in Section 2, diverse sources of risk capital are one of American entrepreneurs' best competitive assets.

Among the consequences of MCI's fight, and U.S. telecom deregulation generally, has been the explosion of the Internet. Thousands of entrepreneurs have jumped on the new opportunities opened up by the Internet to tackle inefficiencies in every industry, often by getting rid of the "middlemen" in markets. Transaction costs are being reduced, price comparisons are easier, and barriers to entry are falling, thus prompting some to call the new economy the "nude economy."¹⁶⁵ For example, Michael Dell's Dell Computer bypassed computer distributors to cut costs to consumers. By offering customers a better deal, Dell has grown his company to become the largest computer maker in the United States.

The rise of Internet retailing illustrates a general feature of entrepreneurial economies: the greatest business fortunes are made by serving the needs of the mass market. Most great entrepreneurs have not become rich by serving the rich, but by lowering prices on

¹⁶⁴ Schweikart (2000), p. 487.

¹⁶⁵ "A Thinker's Guide," *The Economist*, April 1, 2000.

products for all consumers.¹⁶⁶ Henry Ford's Model T was designed as a "car for the great multitudes."¹⁶⁷ Ford's simplicity of design, improved parts casting, and moving assembly line allowed him to lower the price of the Model T from \$825 in 1908, to \$575 in 1912, and finally to \$290 in 1927, its last year of production.¹⁶⁸ Entrepreneur Joseph Bulova turned a similar trick by bringing standardization of parts and mass production to the U.S. watch and clock industry in the 1920s, allowing millions to buy quality time pieces for the first time.¹⁶⁹ Entrepreneurs in many other industries such as firearms, sewing machines, and bicycles, also adopted the new ideas of standardization and mass production so that every family could afford these products. Many of the biggest retail empires, including K-mart, Target, Costco, and Wal-Mart, have grown by initially serving highly budget-conscious consumers then undercutting major retailers from below.¹⁷⁰

In addition, consider Andrew Carnegie's achievements. In the late 1860s, he saw the newly invented Bessemer steel process on a trip to England and realized its potential. Upon return, he implemented the process in America and dramatically reduced the cost of steel production.¹⁷¹ Lower steel costs created wide-ranging ripple effects on the economy, such as pushing down rail transportation charges. By the 1890s, the cost of rails was just one-tenth their cost two decades earlier.¹⁷² These innovations opened up cross-country travel to millions, and pushed down rail freight rates 40 percent in twenty years.¹⁷³ Historian Paul Johnson noted that Carnegie exemplified 19th century U.S. entrepreneurs who, "By achieving enormous economies of scale, turned the luxuries of the rich into the necessities of the poor, and thereby reduced the real price of almost everything."¹⁷⁴

British entrepreneur Richard Branson is a contemporary example of the restless quest to give consumers more for less. Branson began his career at age 16 with a string of unprofitable start-ups in the 1960s

¹⁶⁶ Rosenberg and Birdzell (1986), p. 27.

¹⁶⁷ Freeman and Soete (1997), pp. 138, 141, 143.

¹⁶⁸ Freeman and Soete (1997), p. 141; Schweikart (2000), p. 306; James Flink, *The Automobile Age* (1988).

¹⁶⁹ *Investors Business Daily*, November 10, 1999.

¹⁷⁰ Christensen (1997), p. 111.

¹⁷¹ *Investors Business Daily*, December 8, 1999. See also Freeman and Soete (1997), p. 58.

¹⁷² *Investors Business Daily*, December 8, 1999.

¹⁷³ U.S. Bureau of Statistics, *Statistical Abstract of the United States 1902*, (Washington: Government Printing Office, 1903).

¹⁷⁴ Paul Johnson, "The Prospering Fathers," *Commentary*, July, 1999. See also *Investors Business Daily*, December 8, 1999.

and early 1970s before he struck it big with Virgin Records and Virgin Atlantic airlines.¹⁷⁵ From there he has made forays into nightclubs, software, cola, mortgages, mobile phones, and many other businesses.¹⁷⁶ The Virgin Group today is a “business-making machine” with about 200 firms in widely varying industries and \$5 billion in revenues.¹⁷⁷ Branson thinks of himself as a consumers’ champion who is always on the lookout to bring style, quality, and better value to new markets. Some of his ventures succeed and some fail, but the economy gains from both. Branson notes, “Hopefully we learn from our mistakes...if something completely fails, as long as we pay off all our debts and nobody gets hurt, then I don’t think people disrespect Virgin for trying.”¹⁷⁸

iv. Acting as the Economy's Guinea Pigs

This report has stressed the large uncertainties inherent at the leading edge of modern technological economies. As discussed, no one is an expert on foreseeing future economic events, including even the brightest entrepreneurs. Instead, what makes entrepreneurs unique is that *they act* in the face of this uncertainty. Entrepreneur Margaret Rudkin, founder of the Pepperidge Farm food company, used to say in speeches, “The IBM company used that wonderful one-word slogan, ‘Think.’ But I believe we should add another word to it, and that word is ‘Try.’ There is not much point thinking if you don’t carry out your ideas.”¹⁷⁹

Economist John Maynard Keynes recognized that big uncertainties faced many industries, and he realized that innovations wouldn’t happen if businesspeople simply made easy-to-quantify decisions. Instead, a certain boldness or “animal spirits” must drive entrepreneurs forward to try new things and risk failure.¹⁸⁰ Even today’s experts in risk, the venture capitalists, usually rely on hunches and not number-crunching to figure out which start-ups to invest in.¹⁸¹ Such hunches or animal spirits are ultimately based on a spirit of hope and optimism that an experiment will succeed.

¹⁷⁵ Bhide (2000), p. 35.

¹⁷⁶ BBC news website profile of Richard Branson.

¹⁷⁷ Gary Hamel, “Bringing Silicon Valley Inside,” *Harvard Business Review*, September-October 1999.

¹⁷⁸ “Red Baron,” *Forbes*, July 3, 2000.

¹⁷⁹ *Investors Business Daily*, March 13, 2000.

¹⁸⁰ See discussion in Freeman and Soete (1997), p. 250.

¹⁸¹ Kaplan (1999), p. 193.

A case in point is the story of San Diego's Qualcomm Inc., a leader in wireless telecommunications. The firm was founded in 1985 by former MIT professor, Irwin Jacobs, who developed the idea for a superior high-speed mobile phone technology. Despite huge unknowns when he started, Jacobs pursued his ideas and made them work. Qualcomm today holds key patents to the CDMA wireless standard that it created. But as the *Washington Post* noted, "In the mid-1990s, CDMA was viewed as so risky that manufacturers of its first systems...refused to issue guarantees that the networks would work."¹⁸² Similarly, a Goldman Sachs analyst noted regarding the company's early years, "To claim that a handful of engineers could actually do this was preposterous," and *Business Week* noted that the establishment initially "laughed" at Qualcomm's bold plan.¹⁸³ Nonetheless, Qualcomm stuck to its guns and solved the key technology barriers. Today, the company has annual revenues of \$4 billion, and 15 percent of the world's cell phones use its technology.

The only way to find out whether new ideas will work is if someone takes the risks to find out. Consider Maryland biotechnology firm Celera Genomics. Celera's founder, Dr. Craig Venter, stunned the scientific world in 1998 by announcing that he would privately take on the task of sequencing the human genome.¹⁸⁴ He said he would complete the task at one-tenth the cost and five years before the publicly funded Human Genome Project was scheduled to be completed.¹⁸⁵ Back then, many leading scientists thought his approach would likely fail, and they claimed that it would be riddled with errors if he actually did complete it.¹⁸⁶

In June 2000, Celera finished sequencing the human genome, and joined forces with the publicly funded project as it neared completion. Skepticism about Dr. Venter's strategy is now gone, and most scientists think that private competition was very beneficial to the government project. Dr. Venter has said that he proved that his

¹⁸² "Qualcomm Finds Riches Linking Internet Hand-Held Devices," *Washington Post*, February 20, 2000. See also "Qualcomm's Dr. Strangelove," *The Economist*, June 17, 2000.

¹⁸³ *Business Week*, March 6, 2000.

¹⁸⁴ Celera was set up as an offshoot of PE Corp, a laboratory equipment company that supplied the gene-sequencing machines. See *Forbes*, February 21, 2000, p. 99.

¹⁸⁵ *New York Times*, June 27, 2000.

¹⁸⁶ See "The Race to Crack the Gene Code," *Los Angeles Times*, October 29, 1998; "In Genome Race, Government Vows to Move Up Finish," *New York Times*, September 15, 1998; "Scientists Speed Up Timetable for Mapping Human Genes," *Washington Post*, September 15, 1998.

“shotgun strategy could work on complex genomes.” In fact, the government-funded effort has now adopted his once-derided technique to sequence a mouse genome. Dr. Venter noted, “They realize that [our] strategy is faster, cheaper, and of equal or greater quality, than the conventional approach.”¹⁸⁷

The success of Qualcomm and Celera illustrate how the entrepreneurial economy is a learning machine. The economy learns from failures as well as successes. Apple Computer’s Newton of the early 1990s was the first hand-held computer. The Newton was generally regarded as a technical success, but it failed in the market. But who can blame Apple—the market for hand-helds didn’t exist before they tried to invent it. Their efforts provided the lessons for later entrants and paved the way for the Palm Pilot revolution of the 1990s.¹⁸⁸ As Professor Christensen notes, “Markets that do not exist cannot be analyzed: suppliers and customers must discover them together.”¹⁸⁹

Entrepreneurs themselves “learn by doing” in an iterative process. Entrepreneurs frequently adapt their initial business strategies in light of their many stumbles and unforeseen opportunities.¹⁹⁰ They often encounter problems or opportunities that were invisible before they began.¹⁹¹ As Professor Christensen notes, “Action must be taken before careful plans are made.”¹⁹² For example, Jeff Bezos, founder of Amazon, initially did not plan to stock inventory, but instead to order books from suppliers after customer orders were already received. Once in business, Bezos found out that not stocking inventory was too slow, so he invested heavily in warehouses to provide faster service.¹⁹³ An industry insider said of Bezos, “He’s inaugurated a business model of “Ready, Fire, Steer,” not “Ready, Aim, Fire.”¹⁹⁴

Similarly, consider the early automobile industry. At the end of the 19th century, there was great uncertainty as to whether steam, electricity, or gasoline would be the best fuel source for horseless

¹⁸⁷ Testimony of Dr. Craig Venter before the Joint Economic Committee, June 7, 2000.

¹⁸⁸ Christensen (1997), p. 135.

¹⁸⁹ Christensen (1997), pp. 147, 160.

¹⁹⁰ Bhide (2000), p. 15.

¹⁹¹ Bhide (2000), pp. 62, 63.

¹⁹² See discussion in Bhide (2000), pp. 59, 60.

¹⁹³ Book review of *Amazon.com* in the *New York Times*, June 27, 2000.

¹⁹⁴ “The New Imperialists: Jeff Bezos: Amazon Man,” *Washington Post*, September 3, 2000.

carriages.¹⁹⁵ Many technical and marketing experiments were needed to discover that gasoline was the best way to go. Ransom Olds, the father of the U.S. automobile industry, was faced with many failures before he eventually succeeded. Years of work on steam-powered cars resulted in major failures in 1887 and 1892. He finally succeeded with a gasoline-powered model in 1896, and established the first successful gasoline-powered car company in the country in 1899.¹⁹⁶ Even so, this didn't convince everyone: Thomas Edison asserted in 1910, "The nickel-iron battery will put the gasoline buggy...out of existence in no time."¹⁹⁷

The rise of Fred Smith's Federal Express provides another story of entrepreneurial market discovery. While we take overnight express delivery for granted now, it was up to Fed Ex in the 1970s to show that there was enough demand to warrant it. Smith acted in the face of substantial market and regulatory uncertainty.¹⁹⁸ He first conceived of the idea for a high-priority small package delivery service in a college paper in mid-1960s, although he ironically received a poor grade on the essay. After serving in Vietnam, the inexperienced 26 year-old launched his company in 1971, and struggled to build from the ground up the infrastructure to deliver packages overnight across the country.

Smith began his entrepreneurial climb by purchasing and growing a small Arkansas aviation sales company. Smith thought big: unlike other shippers, he wanted a dedicated fleet of at least two-dozen jets and a central hub operation to create the efficient delivery service he envisioned. He would need a lot of upfront capital, and he set about raising \$50 million from family funds, bank loans, venture capital, private investments, and an IPO. Federal Express began operations in 1973 delivering just 186 packages on its first day of operations. In the early years, the company struggled to assemble a fleet, dodge bankruptcy, delay creditors, raise fresh funds, and secure customers. Fed Ex finally turned an annual profit in 1976 and became a billion-dollar company by the early 1980s.

Smith had also to struggle with the federal government to grow his business. Smith needed special permission from the Civil Aeronautics Board (CAB) to begin air operations because air routes and schedules were heavily regulated at the time. Fed Ex won the approval it needed in 1972 despite lobbying efforts by other interests to hold back this

¹⁹⁵ Freeman and Soete (1997), pp. 140, 194. In 1900, there were more steam-powered and electric-powered cars sold than gasoline-powered; see "100 Years of Innovation," *Business Week*, Summer 1999, p. 35.

¹⁹⁶ *Investors Business Daily*, December 3, 1999.

¹⁹⁷ Timmons (1999), p. 85.

¹⁹⁸ Bhide (2000), pp. 169-85.

new competitive threat. Federal regulators almost dealt Fed Ex other knockout blows in its first few years. In 1973, federal fuel rationing rules threatened to limit availability of fuel to Fed Ex's fleet, but luckily it received a special dispensation. In 1976, Fed Ex had to beg the CAB to allow it to purchase larger jets for expansion. This time Smith's competitors got the upper hand in lobbying, and the CAB denied Fed Ex's request. But the mood in the country was moving towards deregulation, and Fed Ex received a boost with a 1977 act of Congress that deregulated air cargo routes and prices, thereby allowing Smith to acquire larger planes.

Smith's story highlights a number of interesting policy issues. Like MCI, much of Fed Ex's entrepreneurial struggle involved attaining the legal right to operate in the most efficient manner to best serve consumers. Both companies faced regulatory barriers that drove up costs, drained entrepreneurial energies, and made it more difficult to attract investors because of the added uncertainty. For Fed Ex, uncertainty regarding CAB's rulings affected its ability to raise money because political risk reduced the certainty of investor returns.¹⁹⁹

In an earlier decade, Fed Ex and MCI might not have been successful. But the move towards deregulation in the 1970s and 1980s in transportation and telecommunications paved the way for both companies. Entrepreneurs like Fred Smith and Bill McGowan pushed this process along. In addition, deregulation and innovations in the financial markets during these decades gave entrepreneurs greater access to the risk capital necessary to grow their businesses.²⁰⁰

As the economy's guinea pigs, entrepreneurs generate new knowledge of technologies, production costs, consumer preferences, and other unknowns. Their reward for bold action in the face of uncertainty is high financial returns if they are successful. As Michael Lewis notes of Netscape founder and serial entrepreneur Jim Clark, "Clark's willingness to take risks others shunned was the source of his financial power."²⁰¹

v. Turning Inventions into Innovations

Europe and America's historical rise to prosperity is sometimes portrayed as the result of a steady process of merely accumulating new machines and inventions. In this view, scientific advances are seen to almost automatically create higher living standards. This

¹⁹⁹ Bhide (2000), p. 179.

²⁰⁰ For a discussion of this issue, see U.S. Senate (1999).

²⁰¹ Lewis (2000), pp. 43, 188

understanding of economic history can be called the “science push” theory of growth. While this story contains some truth, it is akin to considering the action on only one side of a pair of scissors.²⁰²

The other side of the scissors is the “demand pull” of markets. Demand drives growth by pulling discoveries towards areas where there are growing markets. Entrepreneurs are the link between the push side of inventions and the pull side of demand. They bring about innovation by connecting inventions to markets in a trial-and-error process.²⁰³ This role may be as important as invention itself. For example, empirical evidence has found that “The rate of technical change and of economic growth depends more on efficient diffusion than on being first in the world with radical innovations.”²⁰⁴

Economic growth in some societies that had abundant inventions was stunted because entrepreneurs did not have the freedom to spread innovations to average citizens. Harvard Professor David Landes provides some illustrations in a recent book.²⁰⁵ He finds that a number of non-Western civilizations produced many inventions sometimes hundreds of years ahead of Europe. Islamic science, for example, is thought to have been more advanced than Europe’s from about 750 to 1100 A.D.²⁰⁶ And the Chinese have a long list of inventions to claim, including paper, printing, gunpowder, the compass, and the stirrup.

However, the Chinese economy suffered under an extensive government bureaucracy during many centuries.²⁰⁷ The government strictly regulated a wide range of social and economic activity. Entrepreneurs were not free to convey inventions to the people if it wasn’t in the interests of the centralized bureaucracy, unlike in Europe where authority was more fragmented. For example, in Europe the invention of the mechanical clock in the late 1200s created large changes to society as clocks spread rapidly across the continent. A ready market encouraged craftsmen throughout Europe to refine and improve this mechanical wonder to lower costs and improve accuracy. For example, the invention of the pendulum clock mechanism in the late 1650s by the Dutchman Christiaan Huygens almost immediately

²⁰² Freeman and Soete (1997), pp. 200, 217, 261. See also Rosenberg and Birdzell (1986), p. 262.

²⁰³ The distinction between “invention” and “innovation” goes back to Schumpeter. See Nelson and Winter (1982), p. 263.

²⁰⁴ Freeman and Soete (1997), p. 301.

²⁰⁵ David Landes, *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor* (1999).

²⁰⁶ Landes (1999), p. 54.

²⁰⁷ Rosenberg and Birdzell (1986), pp. 87, 88, 137, 138; Landes (1999), pp. 56, 57.

generated a proliferation of new entrepreneurial companies in England to market the breakthrough to average English families.²⁰⁸ Very soon English entrepreneurs were also competing to improve on the mechanism's design.

In contrast to Europe, Professor Landes notes, "The Chinese treated time and knowledge of time as a confidential aspect of sovereignty, not to be shared with the people."²⁰⁹ As a result, he concludes, "Without a basis in popular consumption, without a clock trade, Chinese horology regressed and stagnated."²¹⁰ Professor Landes notes that other advancements that spurred growth in the West, such as new spinning machines, coal smelting and iron technologies, and shipping, actually lost ground in China when the government decided that they weren't high priorities.

The Chinese inventions of paper and printing did not generate the great diffusion of knowledge that they did in Europe. The Chinese authorities were not keen on new ideas or dissent. By contrast, in Europe printing exploded, particularly after Gutenberg's invention of movable type in the 15th century, because governments could not control it. Within 45 years of Gutenberg, nine million books had been printed in Europe.²¹¹ In Europe, innovation fueled further innovation: it was Huygens's detailed description of his new pendulum mechanism in his 1658 book that allowed entrepreneurs to almost immediately start manufacturing and marketing the invention hundreds of miles away in London.²¹²

Professor Landes concludes that in Europe, "Innovation worked and paid, and rulers and vested interests were limited in their ability to prevent or discourage innovation. Success bred imitation and emulation."²¹³ Economic historian Angus Maddison agrees that the Chinese "showed precocity in major inventions," but that the powerful bureaucracy, supported by tradition and the education system, promoted orthodox thinking.²¹⁴ As a result, potential Chinese entrepreneurs could not turn inventions into beneficial products for average people and the bulk of the population stayed poor. Another historian concluded that:

²⁰⁸ Eric Bruton, *The Longcase Clock* (London: Arco Publications, 1964).

²⁰⁹ Landes (1999), p. 50.

²¹⁰ Landes (1999), p. 50.

²¹¹ Book review of Paul Johnson's *The Renaissance*, *Wall Street Journal*, August 23, 2000.

²¹² Eric Bruton, *The Longcase Clock* (London: Arco Publications, 1964).

²¹³ Landes (1999), p. 59.

²¹⁴ Angus Maddison, *Monitoring the World Economy, 1820-1992* (Paris: Organization for Economic Co-Operation and Development, 1995).

The ingenuity and inventiveness of the Chinese...would no doubt have enriched China further and probably brought it to the threshold of modern industry, had it not been for this stifling state control...It is the State that kill[ed] technological progress in China.²¹⁵

Meanwhile, in Europe entrepreneurs were gaining the upper hand over authority and vested interest with the rise of the Industrial Revolution in the 18th and 19th centuries. This period would not have been a "revolution" if it consisted only of a sequence of famous inventions without entrepreneurs struggling for their implementation. Even Marx and Engels attributed the explosive growth in the Industrial Revolution to the capitalist entrepreneurs who financed the investments and broke down societal barriers to create a growing demand for technological advances.²¹⁶

The entrepreneurs of the Industrial Revolution fought not just market uncertainties, but government regulations and trade restrictions, monopoly guilds, superstitions, ancient prejudices, and entrenched institutions. The English Luddites who rioted for the destruction of new textile machinery during 1811-16 were one of many obstacles entrepreneurs faced in lifting the living standards of the masses. In this case, the advances in clothing manufacturing made possible by the new machines, such as the cotton gin, improved living standards and cut disease rates as durable and washable fabrics, particularly cotton, became cheaper.²¹⁷ Contrary to the Luddites' view, the textile entrepreneurs were benefactors of every citizen.

Certainly, economic growth can be a painful process. But the more hospitable is the environment for entrepreneurs as the agents of change, the faster inventions can be turned into higher living standards for all.²¹⁸ The more hospitable environment for change created by the Renaissance and the Enlightenment allowed Europe to pull ahead of the rest of the world from about 1500 onwards.²¹⁹ Professors

²¹⁵ Etienne Balazs quoted in Landes (1999), p. 57.

²¹⁶ Rosenberg and Birdzell (1986), pp. 88-9.

²¹⁷ Landes (1999), p. xviii.

²¹⁸ Rosenberg and Birdzell (1986), pp. 264, 332. They note, "The long growth in scientific and technical knowledge could not have been transformed into continuing economic growth had Western society not enjoyed a social consensus that favored the everyday use of the products of innovation."

²¹⁹ Angus Maddison, *Monitoring the World Economy, 1820-1992* (Paris: Organization for Economic Co-Operation and Development, 1995).

Rosenberg and Birdzell note that the breakdown and diffusion of European power starting about this time led to “an attack of human hyperactivity—scientific, literary, musical, dramatic, military, political, and commercial.”²²⁰ This hyperactivity ensured that diverse new approaches were tried in every area of human endeavor.

By the 1800s, living standards were rising dramatically in the West—it was the age of the great railroad, telegraph, and steel entrepreneurs. Between 1820 and 1900 GDP per capita rose more than 200 percent in the United States, versus just 25 percent in China.²²¹

One of the great entrepreneurs of the Industrial Revolution in the United States was Samuel Morse. Morse exemplified the process of turning invention into innovation with his championing of the telegraph. The telegraph perhaps changed society in the 19th century more than any other invention, but the industry had many fits and starts before it finally exploded in the mid-1840s. Morse was a tinkerer who borrowed some inventions and added his own, including Morse Code. Perhaps more important than his inventions was his persistent support for the idea of long-distance communication over wire. Like other promoters of new technologies, he encountered great amounts of skepticism. The *New York Times* obituary of Morse noted, “the invention seemed altogether too chimerical to be likely ever to prove of any worth. Again and again he was pronounced a visionary, and his scheme stigmatized as ridiculous.”²²² Morse proved the critics wrong.

After the telegraph began spreading on either side of the Atlantic, Morse and others pursued the possibility of joining the continents with a cable in the 1850s and 1860s. Substantial amounts of risk capital would have to be raised, but this was difficult because “nobody who knew anything about telegraphy would be foolish enough to risk building a transatlantic telegraph; besides, it would cost a fortune.”²²³ Many failed attempts were made and investors were sought to pony up for each new effort. Each time a little more was learned, and the continents were finally linked permanently in 1866.²²⁴

When entrepreneurs introduce a successful innovation, they create a powerful stimulus to new R&D. After Morse showed that the telegraph would work, he created demand-pull feedbacks that

Rosenberg and Birdzell (1986) date the Western acceleration of growth from about the mid-fifteenth century onwards.

²²⁰ Rosenberg and Birdzell (1986), p. 261.

²²¹ Maddison (1995).

²²² As quoted in Standage (1998), p. 41.

²²³ Standage (1998), p. 75.

²²⁴ Standage (1998), pp. 73, 84, 88. The first cross-Atlantic cable had been laid in 1858, but it failed after only a month of operation.

stimulated further research into electricity and communications. Inventors like Alexander Graham Bell and Thomas Edison were drawn to telegraphy research. They knew that they would have a ready place to sell inventions and earn high returns. Edison's telegraphy profits helped to allow him to found his renowned research laboratory in Menlo Park, New Jersey, where "inventions were goals chosen with a careful eye to their marketability."²²⁵ Bell was working on telegraphy equipment when he achieved the first voice transmission over wire, and a new technology explosion was underway.

5. WHAT WILL ENTREPRENEURS DO NEXT?

A. Entrepreneurial Waves

The wave of entrepreneurial activity that spurred the growth of the Internet has had many precedents, including the early growth of telegraphs, automobiles, canals, railroads, electricity, and radio.²²⁶ Like prior technology revolutions, the Internet revolution is changing as it matures. Industries typically progress from waves of entrepreneurial start-ups to widespread consolidation. The 485 U.S. car companies at the start of the 20th century consolidated to just 44 by 1929.²²⁷ The 300 aircraft manufacturers of the 1920s and 1930s consolidated to just a handful today.²²⁸

The Internet industry appears to be following the same pattern. "Even enthusiasts concede that as many as 80 percent of today's Internet companies may not survive—just as almost all the early railroads, car makers, and airlines did not," notes *The Economist*.²²⁹ A report by Forrester Research also predicts that most dot-com retailers will fail and the industry will consolidate within a year.²³⁰

Small entrepreneurial companies typically lead in new industries that have high uncertainty. As new technologies mature, larger companies take the lead as economies of scale become more important.²³¹ Professor Nelson notes that small and new firms are important sources of new technology, but as a technology matures

²²⁵ Rosenberg and Birdzell (1986), p. 250.

²²⁶ *Fortune*, November 22, 1999, p. 174.

²²⁷ James Flink, *The Automobile Age* (1988).

²²⁸ Comments by Warren Buffett in *Fortune*, November 22, 1999, p. 220.

²²⁹ "Dotty About Dot Commerce," *The Economist*, February 26, 2000, p. 5.

²³⁰ Forrester Research press release, April 11, 2000.

²³¹ Freeman and Soete (1997), p. 239. See also Nelson (1996), p. 115.

experience counts more and further improvements become more expensive, thus giving the edge to larger firms.²³²

The telegraph industry—the “Victorian Internet”—provides a good illustration. Years of experimentation with various technologies and “business models” characterized the industry up until the mid-1840s. Then, telegraph fever hit consumers, and financiers began to pour in money to expand the network. From a single line in 1845, the telegraph network mushroomed to 12,000 miles of lines operated by 20 companies just five years later.²³³ Innovations caused the cost of messages to fall steadily until the 1870s when the industry matured and consolidated.²³⁴ By undertaking aggressive expansions and acquisitions, Western Union accounted for 80 percent of the industry’s volume by 1880.²³⁵

By this time, the original telegraph innovators were replaced by “the usual businessmen who take over whenever an industry becomes sufficiently stable, profitable, and predictable.”²³⁶ Entrepreneurs and inventors now sought fortune elsewhere. Thomas Edison, who began his career by tinkering with telegraphy machines, moved on to his investigations into the phonograph, light bulb, and electric generator. Like many entrepreneurs, Edison used earnings from his early successes to give him the resources needed to invest in newer, untried ideas. Alexander Graham Bell was also a telegraph equipment tinkerer. In 1876, he heard the first human voice transmitted electronically through his modified telegraph equipment.²³⁷ His research sowed the seeds of the telegraph industry’s eventual destruction. In just ten years a quarter of a million telephones were in use, and a whole new entrepreneurial wave had begun.²³⁸

The financial boom coincident with the rise of the Internet is following the pattern of prior technology waves, which also saw large flows of risk capital channeled to new firms. The 1920s stock market boom was fueled by growth in the automobile, radio, and electricity industries. While such market booms are sometimes regarded as wasteful “speculation,” in fact, they create enduring value to the

²³² Nelson (1996), p. 39.

²³³ Standage (1998), p. 58.

²³⁴ U.S. Bureau of Statistics, *Statistical Abstract of the United States 1902*, (Washington: Government Printing Office, 1903), p. 418. See also Schweikart (2000), p. 319.

²³⁵ Standage (1998), pp. 171, 119.

²³⁶ Standage (1998), p. 202.

²³⁷ Standage (1998), p. 197.

²³⁸ Standage (1998), p. 204.

economy, as documented by a new study.²³⁹ The boom of the 1920s funded a large group of innovative new companies that later became enduring institutions in the U.S. economy, including RCA, Bristol-Myers Squibb, and Dupont. The study found that the relative number of patents issued during this period has only recently been topped. So while the 1920s boom ended in a crash, it also generated innovations and innovative companies that had greatly beneficial long-term economic effects.

It is possible that technology waves of the 21st century will differ from technology waves of the past. Perhaps large company size will become more important as the “network effects” of information-based industries lead to concentration.²⁴⁰ But experts erroneously predicted in the 1970s that the age of high-tech start-ups was over and that Silicon Valley would consolidate.²⁴¹ Future industries may be less likely to become concentrated because of growing uncertainties in markets, and because smaller firms are benefiting from the trend towards collaborative R&D.²⁴² In a recent report, the Organization for Economic Co-operation and Development noted, “As new technologies and globalization reduce the importance of economies of scale in many activities, the potential contribution of smaller firms is enhanced.”²⁴³ The report goes on to note, “Networking allows small and medium-size enterprises to combine the advantages of smaller scale and greater flexibility with economies of scale and scope in larger markets.”

Whatever the structure of future industries, we do know for sure that there will be many entrepreneurial waves in the 21st century. Future innovations may stem from advances in Internet technologies, biotechnology, nanotechnology, space travel, energy generation, and many other fields. The opportunities available to tomorrow’s entrepreneurs appear to be endless.

B. Creating Public Policy Change

The momentum of change from today’s entrepreneurial and technological revolutions is making governments rethink their role in the economy. Many commentators have noticed the stark contrast between the rapid changes in high-tech industries, and the slow,

²³⁹ “Look at Roaring ‘20s Finds Optimistic Parallels,” *Wall Street Journal*, June 12, 2000.

²⁴⁰ *Financial Times*, March 1, 2000.

²⁴¹ Noted by Saxenian (1994), pp. 87, 118.

²⁴² Freeman and Soete (1997), p. 239.

²⁴³ OECD (2000).

ponderous actions of government. For example, while the federal Telecommunications Act of 1996 was generally regarded as a success, now only four years later many concede that it needs to be updated because of subsequent marketplace developments.

Entrepreneurs are a key force creating momentum to modernize federal economic policy. Consider the dynamic financial services industry. The 1999 repeal of the 67-year old Glass-Steagall banking laws simply reflected the vast changes in the financial services industry that had already been taking place for over two decades. Banks and brokerages had been creeping into each other's businesses since the 1970s, and with recent large-scale bank/insurance/broker mergers the writing was on the wall for Glass-Steagall.²⁴⁴ The chairman of the House Banking Committee, Rep. James Leach, described how Congress followed the lead of entrepreneurs on this reform, "In terms of the law, the finance reform bill represents a profound shift. [But] in terms of the marketplace, it's a moderate shift. The market always leads legislative changes. America is a very fast-changing society. Finance reform was needed in order to keep the law in step with market realities."²⁴⁵ A similar situation is occurring with the rise of electronic stock trading networks and online stock trading, developments which are forcing federal regulators to re-assess nearly every stock market rule.²⁴⁶

American consumers are the ultimate beneficiaries when entrepreneurs help push reforms through government. Like Federal Express in the package delivery business and MCI in the telecommunications business, Enron has helped revolutionize the energy business by pushing for regulatory reforms and by fostering innovation. Like Fed Ex and MCI, Enron has fought government regulations and entrenched market players in their efforts to give consumers better services at lower costs. Enron's Kenneth Lay has grown his company from \$5 billion to \$40 billion in revenues in a decade as he helped revolutionize the electricity and natural gas industries.²⁴⁷

²⁴⁴ Mergers which anticipated the Glass-Steagall repeal were Citicorp and Travelers in 1998, and Bankers Trust and Alex Brown in 1997. See "An Industry is Liberated from the Constraints of the Past," *Financial Times*, January 1, 2000.

²⁴⁵ Interview with James Leach, *Investors Business Daily*, December 8, 1999. Federal Reserve Board Chairman Alan Greenspan has expressed similar views; see *Financial Times*, September 19, 2000.

²⁴⁶ "Markets Compute Response to High-Tech Rivals," *Washington Post*, December 5, 1999.

²⁴⁷ "The Energetic Messiah," *The Economist*, June 3, 2000.

Jim Clark is another entrepreneur who has had the boldness to tackle a big industry needing reform in the launching of Healthon (now WebMD). After founding Silicon Graphics and Netscape, Clark trained his sights on the health care industry after he figured that it spent billions of dollars each year on apparently wasteful paperwork flowing between doctors, patients, and insurers.²⁴⁸ This presented a ripe opportunity for Clark, who envisioned an efficient computer solution to the problem. He invested millions of dollars of his own money, and attracted millions more from venture capitalists, to launch a company in an industry he had no expertise in. Despite some ups and downs, Healthon/WebMD has linked up about half a million doctors, and it claims that its online systems can reduce the cost of health insurance claim transactions from about \$10 to under a dollar.²⁴⁹

The big question for governments is: Can bold entrepreneurs such as these cut costs and improve quality in inefficient and non-innovative public industries? Numerous industries within the government's domain appear to be ready targets for entrepreneurs, including postal services, public education, and space exploration.

Postal Services. U.S. letter delivery is a legally enforced monopoly under the federal "private express statutes." But postal delivery does have some entrepreneurial history in the United States. In the mid-19th century, Henry Wells, later the founder of Wells Fargo, and others entered competition with the federal Post Office. These private firms cut prices and brought substantial innovations to postal delivery, but they were eventually squeezed out by Post Office price cuts and legal actions.²⁵⁰

Today, U.S. Postal Service (USPS) annual revenues of over \$60 billion present a big target for entrepreneurs. The success of companies, such as Federal Express, in near-mail businesses raises the question of whether entrepreneurs should be allowed to compete again in regular mail delivery. There is movement in this direction. A member of the government Postal Rate Commission recently advocated privatizing the USPS and opening it to competition because "consumers would benefit from lower prices and better services."²⁵¹

²⁴⁸ Lewis (2000). Healthon/WebMD advertises that 25 percent of the nation's \$1 trillion in health care costs is "pure waste."

²⁴⁹ "Online Healthcare is Just What the Patient Ordered," *Financial Times*, February 20, 2000.

²⁵⁰ *Investors Business Daily*, November 10, 1999. Also, Schweikart (2000), p. 122. See also Kelly Olds, "The Challenge To the U.S. Postal Monopoly, 1839-1851," *Cato Journal*, v. 15, no. 1.

²⁵¹ "The Postal Service: One Hot Property," *Washington Post*, January 19, 2000.

Other countries, such as Sweden and New Zealand, have taken the lead and opened up their mail systems to competition.²⁵²

Public Education. During the past decade, there has been a growing movement towards school choice in K-12 education, which is a \$300+ billion industry in the United States. Charter schools, school voucher programs, and new entrepreneurial school companies are creating alternatives to the traditional monopoly school systems in a growing number of states. Entrepreneurs are getting a chance to see if they can improve education under the flexible management offered by charter schools (public schools operated with greater autonomy) and new private schools funded with tuition vouchers. School entrepreneurs are not so much focusing on reducing costs, but rather on improving education quality and empowering parents.

Space Exploration. NASA has dominated America's first 40 years in space, but private enterprise has played an important role in areas such as communications satellites. There is a growing movement to open up all space activities to private enterprise. For example, a dozen start-up companies have raised hundreds of millions of dollars to build a space tourism industry.²⁵³ According to an expert at NASA, these entrepreneurs are "adapting existing technologies and making them far cheaper to operate than the Shuttle."²⁵⁴ NASA says it plans to offer use of the new space station to entrepreneurs who see commercial opportunities.²⁵⁵ Another group of entrepreneurs plans to raise money through an IPO to lease the Russian Mir space station and operate it as a tourist destination.²⁵⁶

6. CONCLUSION

In recent decades, the high-tech revolution has coincided with an entrepreneurial revolution in the U.S. economy. New entrepreneurial companies have been the driving force behind the creation and harnessing of new technologies to bring innovation and growth to every sector of the economy. Economic growth has been strengthened

²⁵² Robert Cohen et al., U.S. Postal Rate Commission, "Universal Service Without A Monopoly," November 1999.

²⁵³ "Holiday Pioneers Foresee \$100,000 Star Treks," *Financial Times*, February 20, 2000. See also *Wired*, January 2000, p. 119.

²⁵⁴ "Holiday Pioneers Foresee \$100,000 Star Treks," *Financial Times*, February 20, 2000.

²⁵⁵ "Privatize NASA Now," *Wired*, quoting NASA administrator Dan Goldin, September 25, 1999.

²⁵⁶ "MirCorp Aims for Stratosphere With IPO," *Washington Post*, October 16, 2000.

as deregulation and financial market innovations have allowed entrepreneurs to raise large volumes of risk capital and launch their ideas into the marketplace.

The role of entrepreneurs can be perhaps distilled down to two key economic functions: they generate diverse market experiments and they create competition for established firms. As discussed, technological and market uncertainty are pervasive in the modern economy, particularly in leading-edge industries. As a result, government agencies or dominant companies cannot be relied upon to secure our economic future with overarching strategic plans. Instead, we can best tackle uncertainty and create economic growth by encouraging companies to pursue separate strategies, and by allowing them high levels of flexibility to respond to changing conditions.

In fact, the strength of diverse and decentralized economic decision-making has been chronically underestimated, as gurus for over a century have falsely prophesized that capitalism will become monopolized by large cartels.²⁵⁷ However, widespread and persistent challenges by new and aggressive entrepreneurial businesses have ensured that that has not happened in the United States. It seems even less likely to happen in the future because the economy continues changing rapidly and financial markets continue funneling large amounts of capital to independent risk-taking entrepreneurs.

As entrepreneurs explore every market niche and opportunity, they ensure that industries don't stagnate and fail their customers. Many formerly sluggish and monopolized industries have been opened up and transformed by entrepreneurs in recent decades. Building on this experience, policymakers should consider whether entrepreneurs could add value to industries still operated as monopolies, such as postal delivery and the public school system. If permitted, entrepreneurs may discover many yet unknown innovations to move these industries into the 21st century.

Prepared by Chris Edwards, Senior Economist to the Chairman.

This staff report reflects the views of the author only. These views do not necessarily reflect those of the Joint Economic Committee, its Chairman, Vice Chairman, or any of its Members.

²⁵⁷ Rosenberg and Birdzell (1986), pp. 267, 297.

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Twelve Myths of International Trade

**June 1999
(updated June 2000)**

**Joint Economic
Committee
Office of the Chairman,
Senator Connie Mack**

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FOREWORD

International trade is characterized by numerous myths, many of which are potentially harmful to our economic health. Thus, it behooves us to increase our understanding of this topic. This booklet analyzes 12 of the most common myths. It also provides an understandable explanation of how international trade impacts the lives of Americans.

As technology reduces the costs of transporting both information and goods, markets become more competitive and trade across national boundaries more commonplace. Some fear these developments. However, we must not delude ourselves. Make no mistake about it—Americans derive enormous benefits from international exchange. Without trade, our modern living standards would be impossible.

Since this booklet was first released in June 1999, we have received numerous requests for copies. Many readers told us that it clarified several issues that had previously been puzzling to them. With that in mind, we are releasing this new edition that incorporates recent revisions in the GDP figures and a short section on the empirical relationship between open international markets and economic performance. I hope you will find it both understandable and highly informative.

Senator Connie Mack
Chairman, Joint Economic Committee

The evidence is overwhelmingly persuasive that the massive increase in world competition—a consequence of broadening trade flows—has fostered markedly higher standards of living for almost all countries who have participated in cross-border trade. I include most especially the United States.

Alan Greenspan
Speech before the Alliance for the Commonwealth,
Conference on International Business,
Boston, Massachusetts, June 2, 1999

I. GROWTH OF THE TRADE SECTOR

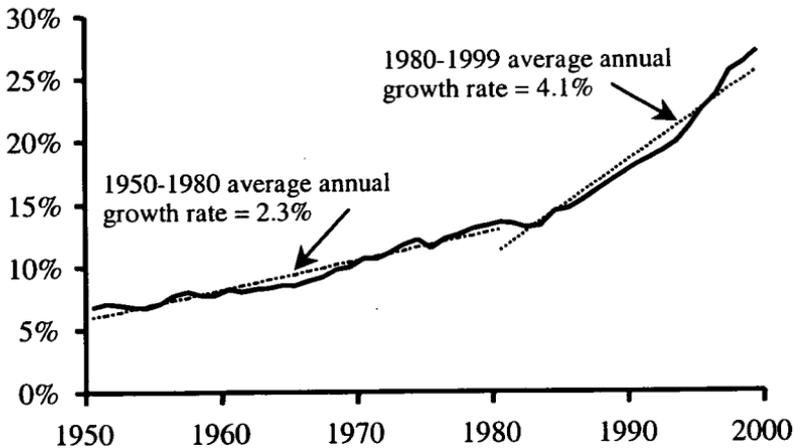
Spurred along by both reductions in trade barriers and falling costs of transportation and communications, the volume of international trade has been growing rapidly throughout the world. Approximately 21 percent of the world's total output is now sold in a different country than it was produced; double that of 1960.

As Figure 1 shows, the trade sector has also grown rapidly in the United States, particularly since 1980. Between 1950 and 1980, international trade (imports + exports) rose from 6.7 percent of GDP to 13.5 percent. Since 1980, trade as a share of the economy has doubled again, soaring to 27.2 percent of GDP in 1999.

Figure 1: Trade as a Share of Real GDP, 1950-1999

The trade sector (imports plus exports as a share of GDP) has grown rapidly, particularly during the last two decades. In 1999 it reached 27.2% of GDP, up from 13.5% in 1980 and 6.7% in 1950.

Imports + Exports
as a % of GDP



Source: Haver Analytics

II. WHY IS INTERNATIONAL TRADE IMPORTANT?

Because of trade, individuals, companies, regions and nations are able to specialize in the production of things they do well and use the earnings from these activities to buy from others those items for which they would be high-cost producers. As a result, trading partners are able to produce a larger joint output and achieve a higher standard of living than would otherwise be possible. Economists refer to this as the law of comparative advantage.

The law of comparative advantage holds that individuals can gain by specializing in those activities where they have a relative advantage. For example, even though most doctors might be good at record keeping and arranging appointments, it is nonetheless generally in their interest to hire someone to perform these services. Time they spend keeping records is time they could have spent seeing patients. Given the value of their time with patients, their earnings will be reduced as more of their time is spent keeping records, and less seeing patients. The relevant issue is not whether doctors are better record keepers than the assistants they could hire, but rather how doctors use their time most efficiently.

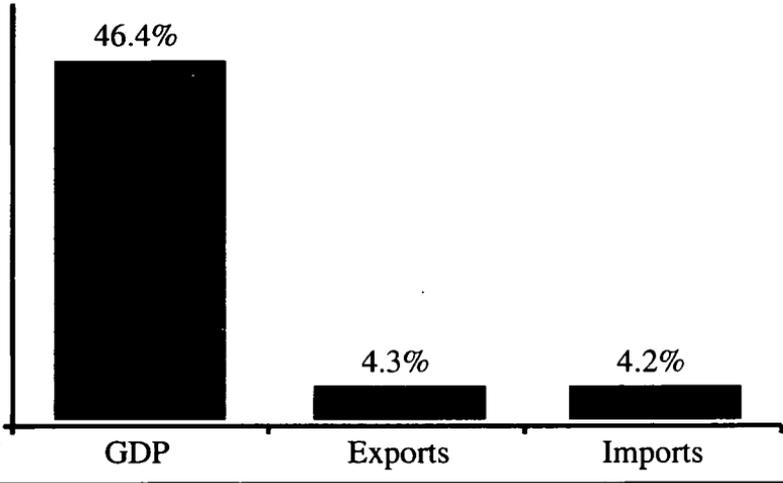
The principle involved here applies equally to nations. The citizens of each nation can gain by spending more of their time and resources doing those things where they have a relative advantage. If a good or service can be obtained more economically through trade, it makes sense to trade for it rather than to produce it domestically. It is a mistake to focus on whether a good is going to be produced domestically or abroad. This is of little importance. The central issue is how the available resources can be used to obtain each good at the lowest possible cost. When trading partners use more of their time and resources producing things they do best, they are able to produce a larger joint output, which provides the source for mutual gain.

International trade also leads to gains from the competitive process. Competition is the mother of both innovation and efficient production. International competition helps keep domestic producers on their toes and provides them with a strong incentive to improve the quality of their products. The experience of the U.S. auto industry illustrates this point. Faced with stiff competition from Japanese firms during the 1980s, U.S. automakers worked hard to improve the quality of their vehicles. As a result, the reliability of the automobiles and light trucks available to American consumers, including those

Figure 2: Price Changes — Imports and Exports Compared to GDP Deflator, 1985–1999(Q4)

The prices of goods and services involved in international trade have increased less than the general price level. Intense competition helps keep prices low in these markets.

Price change,
1985-1999



Sources: Haver Analytics; *Economic Report of the President*, 2000, b-7.

produced by domestic manufacturers, is almost certainly higher than would have been the case in the absence of competition from abroad.

Figure 2 illustrates the impact of dynamic competition in international markets. While the overall price level rose 46.4 percent between 1985 and 1999 (Quarter 1), the price increases of exports (4.3 percent) and imports (4.2 percent) during this lengthy period were much smaller. The low prices reflect the importance of innovation and high productivity in these markets.

III. PRIMARY SOURCE OF TRADE FALLACIES

Despite the gains derived from trade, fallacies abound. Why is there so much misunderstanding surrounding trade issues? The primary source of confusion is a failure to consider the secondary effects—indirect effects that are triggered by an initial change. As the accompanying Thumbnail Sketch indicates, key elements of international trade are closely linked. As a result, you cannot change one element without changing the others. This is the case with imports and exports. Imports cannot be limited without also limiting exports. Our imports provide foreigners with the dollars required to purchase our exports. Trade restrictions that reduce our imports will also reduce the dollar earnings of foreigners. As their dollar earnings fall, foreigners will have to cut back on their purchases from us. Trying to limit imports without simultaneously reducing exports is like trying to hit a baseball up without having it come down.

The foreign exchange market will bring the quantity of dollars demanded by foreigners to purchase things from Americans into equality with the quantity supplied by Americans to purchase things from foreigners. This means that overall, our payments to, and receipts from, foreigners must balance. Thus, a deficit in one area, goods and services for example, is not an isolated event. A goods and services trade deficit implies an offsetting surplus in other areas. More broadly, if a nation is running a current account deficit, it must also be running a capital account surplus. The reverse is also true; a capital account surplus implies a current account deficit.

This pamphlet will address 12 of the most common myths of international trade. As we will see, time and again, trade fallacies arise because of the failure to consider the secondary effects implied by fundamental linkages. Let us turn to some of the more enduring myths of international trade.

Some Key Relationships of International Trade

— A Thumbnail Sketch

1. Exports and imports are linked. U.S. exports provide Americans with the foreign exchange required to purchase imports. Similarly, U.S. imports provide foreigners with the dollars required to buy things from Americans.

2. The exchange rate will bring the quantity of dollars foreigners demand in order to make purchases from Americans into equality with the quantity Americans supply in order to make purchases from foreigners.

3. Exports + Net Foreign Investment = Imports¹

4. When the exchange rate is determined by market forces, the current and capital accounts must balance. Therefore, when there is a capital account surplus—that is a net inflow of capital—there must also be a current account deficit of equal size.²

¹ This formula omits net investment income and unilateral transfers, both of which are small relative to the trade and capital flows of the United States.

² The Current account includes investment income and unilateral transfers, as well as the trade balance on goods and services. When we speak of the trade surplus or deficit, we are referring to the balance on goods and services rather than the narrower balance on merchandise trade.

**TABLE 1: TWELVE COMMON MYTHS OF
INTERNATIONAL TRADE**

1. Trade is a zero-sum activity. If one trading party gains, the other must lose.
 2. Imports reduce employment and act as a drag on the economy. Exports promote growth and employment.
 3. Tariffs, quotas and other import restrictions will save jobs and promote a higher level of employment.
 4. When a high-wage country trades with a low-wage country, the wages of workers in the high-wage country will be pulled down.
 5. It is sound policy for a country to support a weak industry with subsidies. A liberal interpretation of "dumping" is necessary to protect domestic industry.
 6. A trade surplus is good; a deficit is bad.
 7. A trade deficit is the result of bad economic policy. It indicates that the economy is in trouble.
 8. If trade with another country is fair, our exports to the country will equal our imports from it.
 9. A country cannot continue to run trade deficits year after year.
 10. A country that runs a trade deficit loses jobs. A country that runs a trade surplus gains them.
 11. Our merchandise trade deficits indicate that the U.S. is de-industrializing.
 12. Pegged exchange rates are a good strategy. They allow a country to have relatively stable exchange rates while still pursuing an independent monetary policy.
-

IV. TWELVE MYTHS OF INTERNATIONAL TRADE

Myth 1 *“Trade is a zero-sum activity. If one trading party gains, the other must lose.”*

Mutual gain provides the basis for trade. International trade is no exception. Domestic producers are often able to sell products at attractive prices to purchasers abroad. On the other hand, domestic consumers will find it attractive to purchase various products from foreign suppliers. In essence, trade makes it possible for the people of a nation to sell at higher prices goods they produce cheaply and to buy at lower prices items that would be costly to produce domestically. What a deal! Gain is derived from both the higher prices for exported goods and the lower prices for those imported.

Modern production of goods, ranging from pencils to computers, involves the cooperation of literally tens of thousands of people. International trade facilitates this cooperative effort. Trade makes it possible for people in different nations with vastly different skills and resources at their disposal to specialize in those areas where they are low-cost producers, while trading for those items that would be costly for them to produce. This specialization makes it possible to produce a larger joint output than would otherwise be possible. In turn, the larger output allows each to achieve a higher standard of living.

Consider the case of trade between the United States and Brazil. The U.S. and Brazil are able to produce a larger joint output when Americans supply wheat and Brazilians coffee. The larger production will make it possible for Americans to gain by using revenues from their wheat sales to buy Brazilian coffee. At the same time, Brazilians will gain by doing the opposite, by using revenues from their coffee sales to buy American wheat. In turn, the larger joint output provides the basis for the mutual gains achieved by both.

Myth 2 “Imports reduce employment and act as a drag on the economy. Exports promote growth and employment.”

This fallacy stems from a failure to consider the link between imports and exports. Our imports provide foreigners with the purchasing power to buy our exports. If foreigners are unable to sell as much to Americans, then they will have fewer dollars with which to buy from Americans. Therefore, when the volume of imports declines there will be an automatic secondary effect; foreigners will have fewer dollars with which to buy American goods.

Reflection on the function of the foreign exchange market can help clarify the relationship between imports and exports. The foreign exchange market will bring the demand for dollars in exchange for other currencies into equality with the supply. Foreigners demand dollars in order to buy goods and services from Americans (our exports) and to make investments in the United States. Americans supply dollars to the foreign exchange market in order to import goods and services and to make investments abroad. Therefore, the following relationship must hold:

$$\text{Exports} + \text{Foreign Investment in U.S.} = \text{Imports} + \text{U.S. Investment Abroad}$$

Foreign investment in the U.S. minus U.S. investment abroad is equal to net foreign investment. Thus, the above equation can be rewritten as:

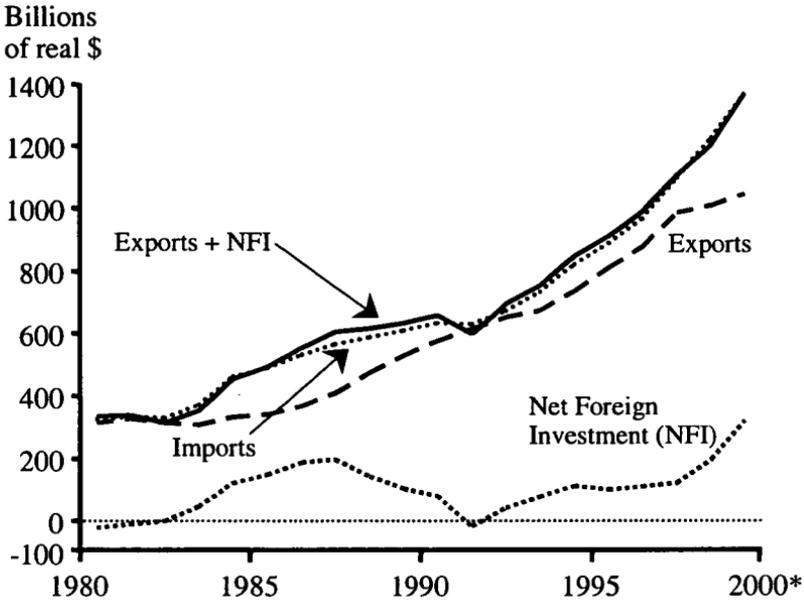
$$\text{Exports} + \text{Net Foreign Investment} = \text{Imports}$$

This equation illustrates an extremely important point: a change in imports will lead to a change of similar magnitude in exports plus net foreign investment. This is not some abstract concept dreamed up by economists. As Figure 3 shows, this relation holds in the real world.

As imports have grown rapidly during the last two decades, exports plus net foreign investment have grown by a similar amount.

Figure 3: Imports = Exports + Net Foreign Investment

As imports increase, exports plus net foreign investment increase by a similar amount. Any employment reductions due to imports growth are offset by employment increases in export industries and other activities resulting from lower interest rates accompanying the capital inflow.



Sources: Haver Analytics; *Economic Report of the President*, 2000, b-22.

Note: 1999:Q3 net foreign investment figure used for 2000—latest available.

Once this relationship is recognized, the fallacy of the "imports reduce employment" view is obvious. An expansion in exports will increase employment in our export industries, while an increase in net foreign investment will lower interest rates and thereby stimulate investment and employment throughout the economy. The expansion in employment, as the result of these two factors, will offset the employment reduction in import-competitive industries. There is no reason to expect any net change in overall employment.

Myth 3 “*Tariffs, quotas and other import restrictions will save jobs and promote a higher level of employment.*”

Like the previous fallacy, this one also stems from the failure to recognize that a reduction in imports does not take place in isolation. When we restrict foreigners from selling to us, we are also restricting their ability to obtain the dollars needed to buy from us. Therefore, trade restrictions that reduce the volume of imports will also reduce exports plus net foreign investment by an equal amount. Thus, any jobs "saved" by the restrictions will be offset by jobs "lost" due to a reduction in exports and higher interest rates as a result of the decline in the net capital inflow.

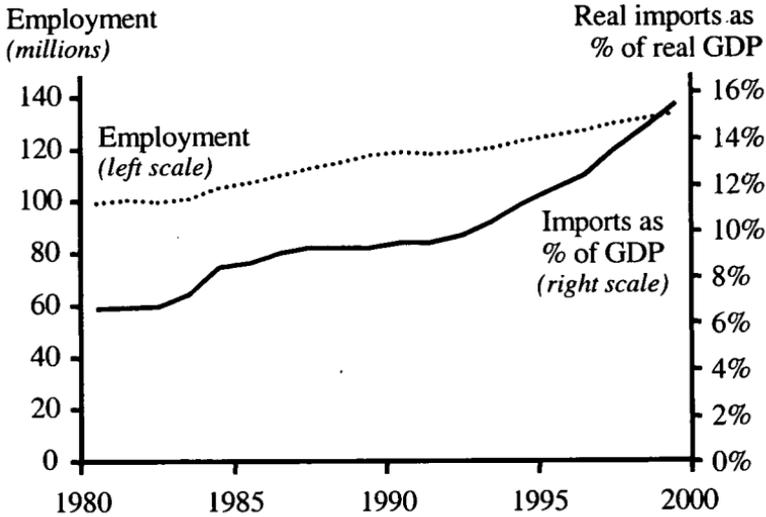
As Figure 4 shows, the U.S. has experienced an unprecedented expansion in imports as a share of the economy. But this did not retard employment. Civilian employment in the U.S. rose from 99 million in 1980 to 119 million in 1990 and 133.5 million in 1999. Thus, the unprecedented growth of imports during the last two decades has been accompanied by an unprecedented growth in employment.

While there is no reason to expect that changes in the size of the trade sector will influence aggregate employment, it is a mistake to focus on the employment issue. After all, income and high productivity, not jobs, are the sources of prosperity. Consider the following: if import restrictions are a good idea, why don't we use them to restrict trade among the 50 states? After all, think of all the jobs that are lost when, for example, Michigan "imports" oranges from Florida, apples from Washington, wheat from Kansas, and cotton from Georgia. All of these products could be produced in Michigan. However, the residents of Michigan generally find it cheaper to "import" these commodities. Michigan gains by using its resources to produce and "export" automobiles (and other goods it can produce economically) and then using the sales revenue to "import" goods that would be expensive to produce in Michigan.

Most people recognize that free trade among the 50 states is a major source of prosperity for each of the states. Similarly, most recognize that "imports" from other states do not destroy jobs, at least not for long. The implications are identical for trade among nations. Free trade among the 50 states promotes prosperity; so, too, does free trade among nations.

Figure 4: Employment and Imports as a Share of GDP, 1980-1999

Imports have increased sharply as a share of GDP, as has employment. Changes in imports cause exports plus net foreign investment to change by a similar amount (see Figure 3). Therefore, changes in the volume of imports do not adversely affect total employment.



Source: Haver Analytics.

Of course, sudden removal of trade barriers might harm producers and workers in protected industries. It may be costly to transfer quickly the protected resources to other, more productive activities. Gradual removal of the barriers would minimize this shock effect and the accompanying cost of relocation.

Myth 4 *“When a high-wage country trades with a low-wage country, the wages of workers in the high-wage country will be pulled down.”*

Many Americans believe that if it were not for trade restrictions, American wages would fall to the level of workers in poor countries. How can Americans compete with workers in countries such as Mexico and China who are willing to work for \$1 per hour or less? This fallacy stems from a misunderstanding of both the source of high wages and the law of comparative advantage. Workers in the U.S. are well educated, possess a high skill level, and work with large amounts of capital equipment. These factors contribute to their high productivity, which is the source of their high wages. Similarly, in countries like Mexico and China, wages are low precisely because productivity is low.

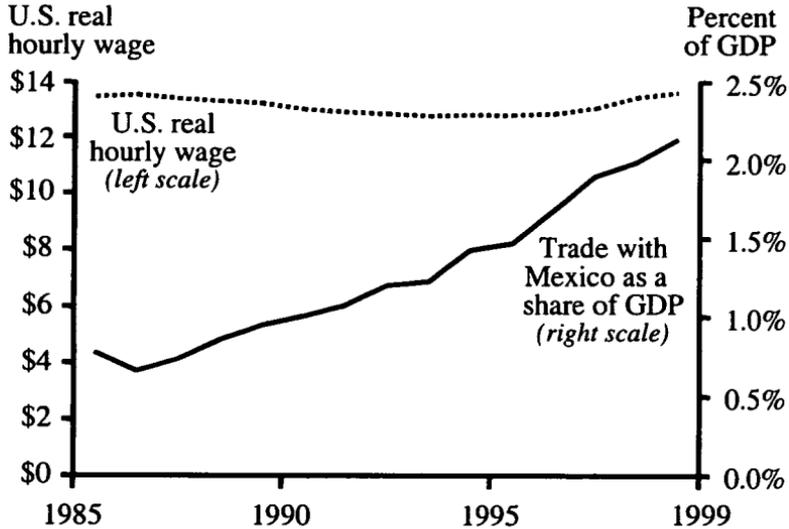
It is comparative advantage that determines which goods will be imported and which will be exported. When resources are directed by relative prices and the principle of comparative advantage, both high- and low-wage countries are able to reallocate resources away from goods and services for which they are high-cost producers and toward those items they can supply economically. Both can gain from specializing in activities they do relatively better. The comparative advantage of low-wage countries is likely to be in the production of labor-intensive goods, such as toys, textiles, and assembled manufactured products. On the other hand, the comparative advantage of the United States lies in the production of high-tech manufacturing products and other goods produced economically by a well-educated labor force.

Thus, trade reflects relative advantage, not wage levels. We recognize this point with regard to domestic trade. No one argues that trade between doctors and lawn service workers, for example, will lead to wage equalization between the two. Because of their different skills and costs of providing alternative goods, both high-wage doctors and low-wage lawn care workers can gain from trade. The same is also true for trade across national boundaries.

If foreigners, including those earning low wages, are willing to sell us a product cheaper than we ourselves can produce it, we can gain by using our scarce resources to produce other things. An extreme example will illustrate this point. Suppose a foreign producer (perhaps because workers were willing to work for little) was willing to supply us quality automobiles for free. Would it make sense to enact a tariff barrier to keep out the autos? Of course not. Resources that were previously used to produce automobiles could now be freed to produce

Figure 5: U.S. Trade with Mexico and Growth of Real Hourly Wages

During the 1990's, U.S. trade with Mexico, China, and other low-wage countries has grown rapidly. There is no evidence that this trade has depressed real wages in the United States.



Source: Haver Analytics.

other goods. The real income and availability of goods would expand. It makes no more sense to erect trade barriers to keep out cheap foreign goods than to keep out free autos.

Myth 5 *“It is sound policy for a country to support a weak industry with subsidies. A liberal interpretation of ‘dumping’ is necessary to protect domestic industry.”*

If a foreign country can supply us with a commodity cheaper than we ourselves can make it, [we had] better buy it off them with some part of our own industry, employed in a way in which we have some advantage.

Adam Smith³

As Adam Smith noted more than two centuries ago, a nation can gain from trade whenever a good can be acquired from foreigners more cheaply than it can be produced domestically. When foreign governments subsidize their exports to us, they are subsidizing American consumers. Of course, the subsidies are costly to the taxpayers funding them. With time, they are likely to tire from the burden and bring the subsidies to a halt.

If foreigners are subsidizing their producers, some argue we should do the same. This makes no sense. Merely because foreigners are wasting their resources propping up inefficient suppliers is no reason for us to engage in the same folly. As with other trade restrictions, export subsidies will channel more of our resources toward production of things we do poorly and away from things we do well. A smaller output and lower level of income will result. Put simply, neither individuals nor nations can expect to get ahead by spending more time producing things they do poorly.

Similarly, a liberal interpretation of "dumping" in the application of our anti-dumping laws impedes our country's economic growth. The current law provides relief in the form of anti-dumping duties (tariffs) when a domestic industry is injured as the result of a good being sold in the United States at a price below cost or lower than that found in the domestic market of the exporting firm. However, it is not easy to tell whether dumping laws are, in fact, being violated. The prices charged in the home market generally vary and the costs of the firms charged with dumping are not directly observable. Some express fear that foreign producers might attempt to drive domestic firms from the market and then raise their prices to a higher level. This is unlikely to be an effective strategy. After all, the high prices would soon attract competitors, including other foreign suppliers.

³ Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776; Cannan's ed., Chicago: University of Chicago Press, 1976), pp. 478-479.

When analyzing the merits of anti-dumping restrictions, it is important to keep two points in mind. First, price-cutting is an integral part of the competitive process. When demand is weak and inventories are large, firms will often find it in their interest to offer goods at prices below the average total cost of production. Domestic firms are permitted to engage in this practice. Why should foreign firms be prohibited from doing so? Second, the use of anti-dumping laws to reduce the competitiveness of domestic markets is sure to be contagious. As a few industries are protected from the competition of foreign rivals, others will seek similar treatment. Herein lies the real danger. If we are not careful, anti-dumping actions will soon become simply another, rather thinly veiled, mechanism to stifle competition. Our economy has prospered largely because of our reliance on market allocations and avoidance of this type of favoritism. We must not allow the credibility we have earned to be eroded by myopic policies.

Myth 6 “A trade surplus is good; a deficit is bad.”

The trade deficit does not belong to any individual or institution. It is a pure statistical aggregate, like the number of eggs laid in the U.S. or the number of bald-headed men living here.

HERBERT STEIN⁴

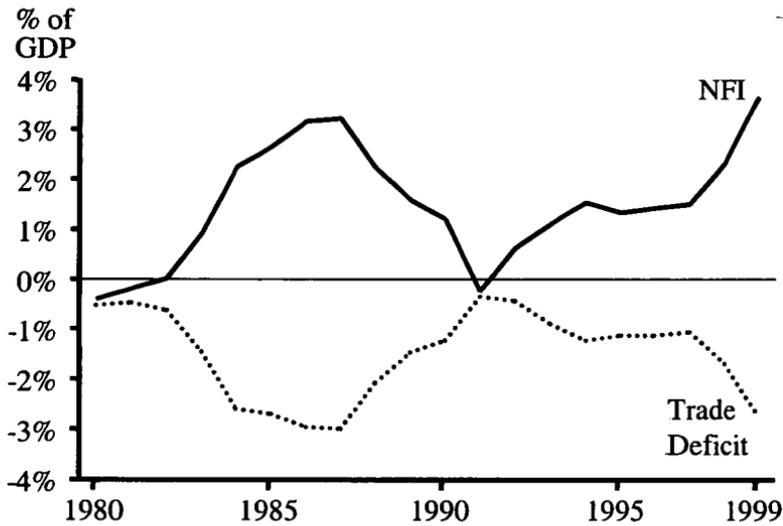
The term "trade deficit" is misleading. "Deficit" generally suggests something bad—like excessive spending relative to income or an overdraft at the bank. A trade deficit occurs when a nation receives more goods and services from foreigners than it supplies to them. What's bad about that? After all, isn't consumption the ultimate objective of economic activity? Conversely, a trade surplus is present when a nation supplies more goods and services for foreigners to consume than it receives from them. What is so good about that situation? Is this something that people will want to continue? A trade deficit is the flip side of a capital account surplus. With floating exchange rates, market forces will bring American purchases of goods, services, and assets from foreigners into balance with sales of these items to foreigners. Thus, a trade deficit will occur when the U.S. economy is offering investors such attractive options that foreigners are investing more in the United States —buying more assets than Americans are investing abroad. Again, it is hard to see what is bad about this situation. Would we prefer that our economy be in such poor shape that investors, domestic as well as foreign, had better options elsewhere?

Doesn't a trade deficit mean greater indebtedness to foreigners? Not necessarily. Much of the foreign investment involves the purchase of stocks and physical assets like buildings and business assets. Americans benefit because they are able to sell these assets to foreigners at more attractive prices than would otherwise be possible. Foreign investments of this type do not increase American indebtedness to foreigners. Some foreign investments are in the form of loans or the purchase of bonds. These transactions mean lower interest rates for Americans. If the investments are sound, they will generate a future income stream that is more than sufficient to repay the loans. Even in this case, the loans are helpful to the U.S. economy.

⁴ Herbert Stein, "Leave the Trade Deficit Alone," *The Wall Street Journal*, March 11, 1987.

Figure 6: Trade Deficit and Net Foreign Investment as a Share of GDP

Net foreign investment (NFI) and the trade deficit are closely linked. When NFI changes, so too does the trade deficit.



Source: Haver Analytics; *Economic Report of the President*, 2000, b-22.

No legal entity is responsible for the trade deficit. It is merely an aggregation of the buying and selling decisions of millions of people. Suppose an American retailer purchases \$500,000 of shoes from a British manufacturer. In turn, the British firm uses the funds to buy stocks or bonds issued by an American corporation. These transactions will increase the size of the trade deficit. But why is there any reason for concern? They reflect the voluntary choices of individuals that will both reap the benefits and bear the costs. This is also true for the aggregation of a nation's trade deficit or surplus.

Myth 7 “A trade deficit is the result of bad economic policy. It indicates that the economy is in trouble.”

Generally, the truth is just the opposite. When the economic environment of a country is attractive to investors—domestic as well as foreign—net foreign investment will be positive and sizeable. This inflow of capital will lead to a capital account surplus. With flexible exchange rates, the capital account surplus will lead to a current account (primarily trade) deficit. Thus, the current account trade deficit is the result of attractive economic conditions generating net foreign investment.

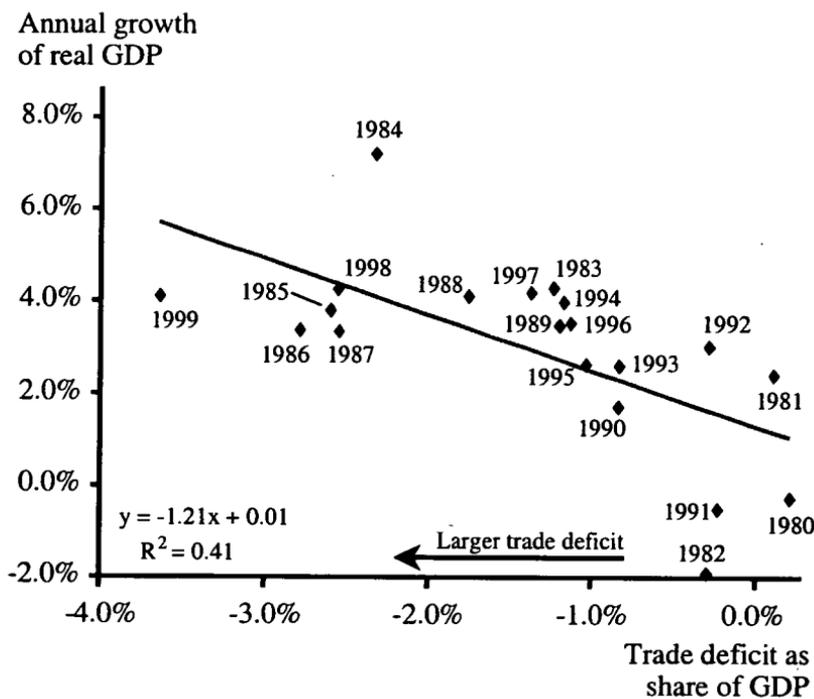
In the case of the United States, there is also another factor at work. Compared to other industrial countries, the U.S. has a low saving rate and more rapid growth of the labor force. The rapid growth of the labor force will enhance both the productivity of, and demand for, capital. Because the saving rate is low, the strong demand will lead to an inflow of capital. Thus, the predictable impact of low saving and rapid growth of employment is an inflow of foreign capital. This situation is likely to continue as long as the U.S. economy provides attractive opportunities for foreign investors. Because the trade deficit is merely the flip side of the capital inflow, it is also predictable that the U.S. will continue to run a trade deficit as long as the economy remains strong.

The balance on goods and services is also influenced by economic growth. Perhaps surprising to some, rapid growth relative to trading partners will tend to enlarge the size of a country's trade deficit (or shift its trade balance from surplus to deficit). The rapid growth of income will stimulate imports, while the sluggish growth of the trading partners will mean weak demand for the country's exports.

Figure 7 illustrates the relationship between economic growth and the trade deficit. Low rates of economic growth are associated with smaller trade deficits. The trade deficit expands as the growth rate increases. Far from indicating economic trouble, trade deficits are often the result of an attractive investment environment and more rapid growth than one's trading partners.

Figure 7: The Trade Deficit and Changes in GDP, 1980–1999

Attractive investment opportunities and rapid growth of GDP encourage both net foreign investment and the growth of imports. This graphic shows how higher rates of growth increase the size of the trade deficit.



Source: Haver Analytics.

Myth 8 *“If trade with another country is fair, our exports to the country will equal our imports from it.”*

This statement is totally false. There is no more reason to expect bilateral trade to balance between nations than between individuals. Rather, the predictable result is (a) trade deficits (purchases that exceed sales) with trading partners that are low-cost suppliers of goods and services that we import intensely and (b) trade surpluses (sales that exceed purchases) with trading partners that buy a lot of the things we supply at a low cost.

Consider the trade "deficits" and "surpluses" of a doctor who likes to golf. The doctor can be expected to run a trade deficit with sporting goods stores, golf courses, and favorite suppliers of items like lawn care, plumbing, and auto repairs. Why? The doctor is highly likely to purchase these items from others. On the other hand, the doctor can be expected to run trade surpluses with medical insurers, elderly patients, and those with chronic illnesses. These trading partners are major purchasers of the services provided by the doctor. Furthermore, if the doctor has a high rate of saving, the surpluses will substantially exceed the deficits.

The same principles are at work across nations. A country can expect to run sizeable surpluses with trading partners that buy a lot of the things the country exports, while trade deficits will be present with trading partners that are low-cost suppliers of the items imported. Table 2 indicates the nations with which the U.S. ran the largest bilateral trade surpluses and deficits in 1998. The surpluses were largest with the Netherlands, Australia, Belgium-Luxembourg, Brazil, and the United Kingdom. Do these bilateral trade surpluses indicate that the U.S. treats these countries unfairly? Of course not. The surpluses merely reflect that these countries import goods that American producers supply cheaply. On the other hand, the U.S. ran large bilateral trade deficits with Japan, China, Germany, Canada, and Mexico. Do these countries unfairly discriminate against American goods? The U.S. will tend to run bilateral trade deficits with countries that are low-cost suppliers of goods Americans import intensely. This is the major factor at work here. Interestingly, Canada and Mexico—two countries that are most open to U.S. products—are among the high-deficit countries.

What about the trade deficit with Japan? Among high-income industrial countries, Japan's trade practices are perhaps the most restrictive. However, this is not the major reason for the U.S. trade deficit with Japan. Japan is a major importer of resources like oil and a major exporter of high-tech manufacturing goods. Americans import a

lot of the latter, but they export very little of the former. If the U.S. were a low-cost supplier of energy, its trade balance with Japan would look much different. Major energy exporters including Indonesia, Oman, Saudi Arabia, and the United Arab Emirates all run sizeable trade surpluses with Japan. In addition, the Japanese saving rate is high and its investment abroad is large. As we have already noted, an outflow of capital will mean a trade surplus. In contrast, the U.S. has a low rate of saving. This differential saving rate between the two countries also contributes to the U.S.-Japanese bilateral trade deficit.

Table 2: Top Ten U.S. Trade Surplus and Trade Deficit Countries in 1998

<u>Country</u>	<u>Trade Surplus</u> — billions of \$ —	<u>Country</u>	<u>Trade Deficit</u> — billions of \$ —
Netherlands	11.4	Japan	-64.1
Australia	6.5	China	-56.9
Belgium-Lux.	5.7	Germany	-23.2
Brazil	5.0	Canada	-18.5
United Kingdom	4.3	Mexico	-15.7
Saudi Arabia	4.2	Taiwan	-15.0
Argentina	3.6	Italy	-12.0
Egypt	2.4	Malaysia	-10.0
Hong Kong	2.4	Thailand	-8.2
United Arab	1.7	South Korea	-7.4

Source: Department of Commerce.

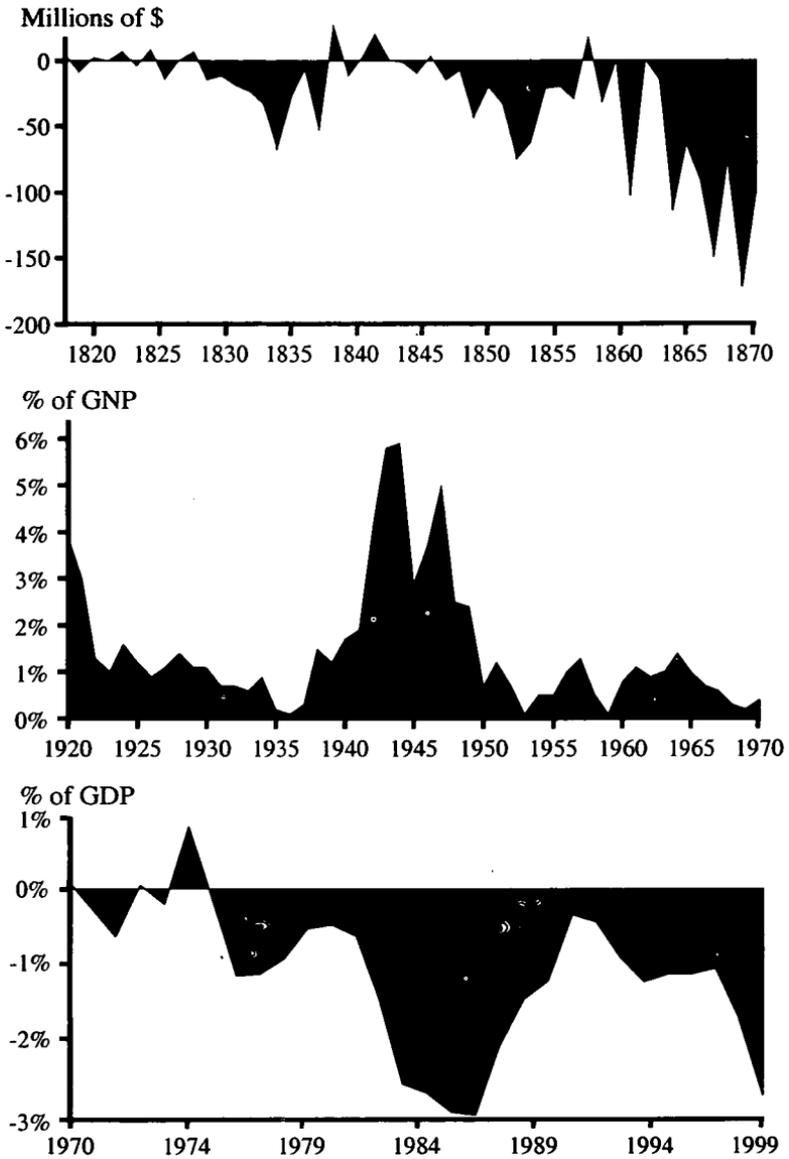
Myth 9 *“A country cannot continue to run trade deficits year after year.”*

The losses of a business-firm must be reversed or eventually they will lead to bankruptcy. Trade deficits are not like that. Not only can a country continue to run a trade deficit year-after-year, but persistent deficits are likely to be the case for a high-growth economy with an attractive investment environment, particularly if the country's saving rate is low.

A trade deficit results when a country's investment exceeds its domestic saving. Net foreign investment will fill this gap. Remember, a trade deficit is the flip side of net foreign investment. As long as the investment opportunities are large enough to provide foreign investors with competitive rates of return, they will be happy to continue supplying the funds. In the case of debt financing, as long as the net income generated by the investment is large enough to cover the borrowing costs, there is no reason why the process cannot continue indefinitely. There are no automatic forces that will cause either a trade deficit or a trade surplus to reverse.

U.S. history illustrates this point. As Figure 8 shows, the U.S. ran trade deficits almost continuously from 1820 to 1870. At this time, the U.S. was a relatively poor (by European standards), but rapidly growing country. Foreign investment helped propel that growth. The situation changed after World War I. The U.S. was richer and investment opportunities were more limited. Thus, trade surpluses were present almost continuously between 1920 and 1970.

During the last 25 years, the situation has again reversed. When considering the significance of the recent trade deficits, it is important to remember that the U.S. has a system of secure property rights, a stable monetary and political environment, and a rapidly growing labor force (compared with Europe and Japan). This makes it an attractive country in which to invest. At the same time, the U.S. saving rate is low compared to our major trading partners. The U.S. trade deficit reflects these factors and it is likely to continue as long as they are present.

Figure 8: Balance of Trade on Goods & Services

Source: Department of Commerce; Haver Analytics.

Myth 10 *“A country that runs a trade deficit loses jobs. A country that runs a trade surplus gains them.”*

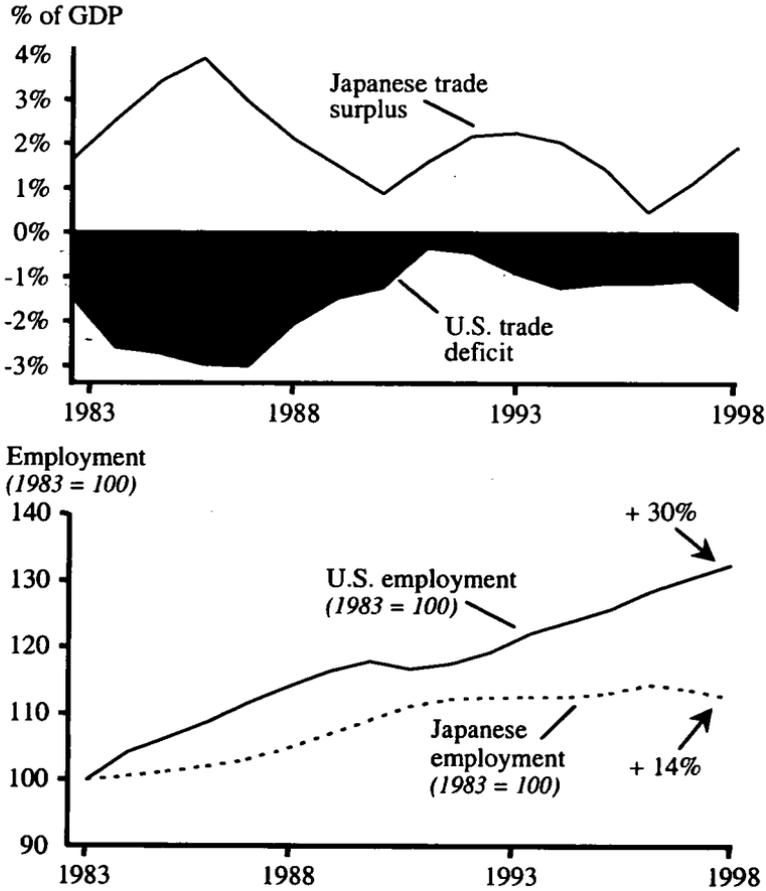
Once again, this view ignores the link between a trade deficit and an inflow of net foreign investment. As Figure 6 shows, net foreign investment is the flip side of a current account trade deficit. You cannot have one without the other, at least not for long. To the extent that a trade deficit (excess of imports over exports) reduces employment, net foreign investment will lead to lower interest rates and stimulate employment. These two factors will offset each other. Thus, there is no reason why a trade deficit will either increase or decrease employment.

The U.S. and Japan provide a test case for this proposition. As the top panel of figure 9 shows, Japan has persistently run a large current account surplus, while the U.S. has persistently run a deficit. But look at the employment growth of the two economies. During the last 15 years (1983-1998) employment in the United States has risen 30 percent. During the same period employment in Japan rose only 14 percent. Even though Japan persistently runs trade surpluses while the U.S. runs deficits, the U.S. experienced the larger employment growth.

According to economic theory, there is no reason to believe that either trade deficits or trade surpluses will exert a significant impact on employment growth. The empirical evidence is supportive of this view.

Figure 9: Trade Balances and Employment: US vs. Japan, 1983-1998

Japan has persistently run a trade surplus while the US has run trade deficits. Nonetheless, US employment growth has been more rapid.



Source: OECD Economic Outlook #65, OECD; Haver Analytics; World Development Indicators 2000, World Bank.

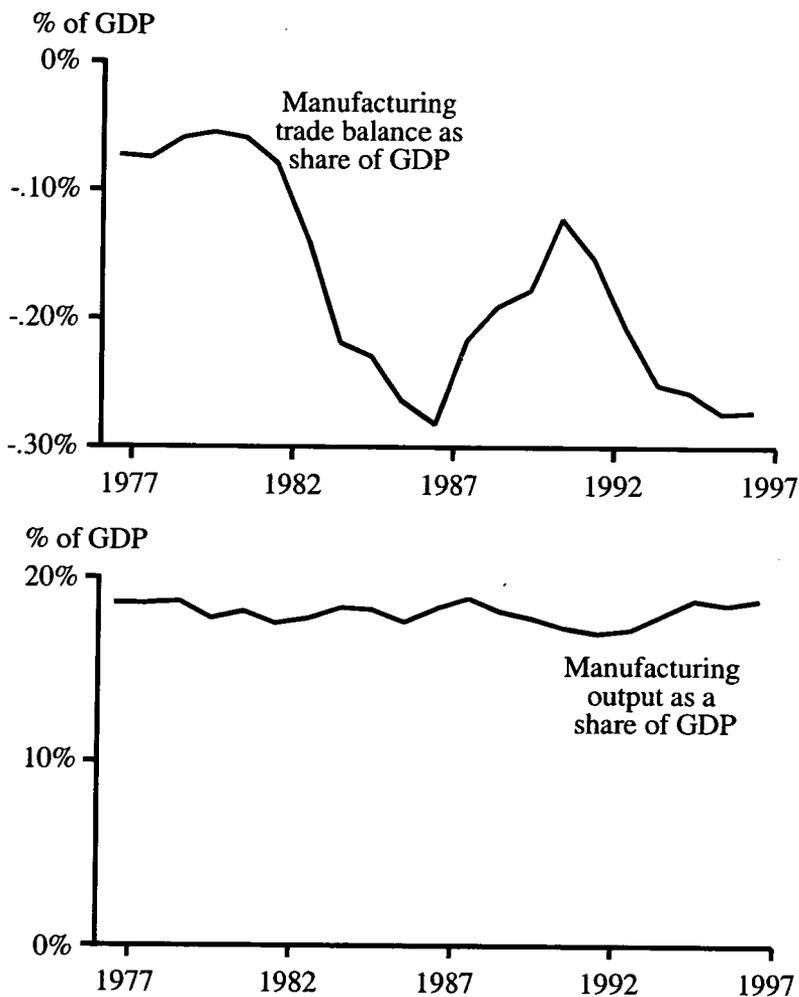
Myth 11 *“Our merchandise trade deficits indicate that the U.S. is de-industrializing.”*

The de-industrialization myth stems from the mistaken belief that because manufacturing employment has fallen significantly as a share of total employment, industrial production must be falling as well. But this is not the case. Actually, manufacturing output has been growing rapidly. Since the current string of consecutive trade deficits began in 1976, U.S. manufacturing output has risen 90 percent. As Figure 10 illustrates, manufacturing output has hovered around 20 percent of GDP throughout this period.

If manufacturing output has remained constant as a share of GDP, why has manufacturing employment fallen? Growth of productivity provides the answer. Because productivity growth in manufacturing has persistently exceeded other sectors of the economy, a smaller number of workers is required to maintain manufacturing output as a relatively constant share of total output.

Figure 10: Manufacturing Output and Manufacturing Trade Deficits, 1976-1998

The magnitude of the US manufacturing trade deficit has varied significantly over the past two decades. Nonetheless, manufacturing's share of GDP has remained relatively constant.



Source: *Economic Report of the President*, 1999.

Myth 12 “Pegged exchange rates are a good strategy. They allow a country to have relatively stable exchange rates while still pursuing an independent monetary policy.”

There are three major types of exchange rate regimes: (1) flexible rates, (2) fixed rates (a unified currency), and (3) pegged rates. The United States and most of the other industrial countries have flexible exchange rates—market forces determine the foreign exchange value of their currencies. The distinguishing characteristic of a fixed-rate, unified currency regime is the presence of only one central bank with the power to expand and contract the supply of money. For the dollar, that central bank is the Federal Reserve.

In addition to the United States, several other countries are also part of the unified dollar system. Panama has essentially adopted the dollar as its domestic currency. Both Argentina and Hong Kong used currency boards to link their currencies to the dollar. None of these countries has a central bank with the power to expand and contract the money supply. They essentially accept the monetary policy of the Fed. The eleven countries of the European Monetary Union recently adopted a fixed-rate, unified system and they will soon have a common currency. Again, this regime will operate with only one central bank that has the power to alter the money supply.

Both flexible and unified-fixed rate regimes avoid persistent problems in balancing supply and demand for money. The regime that leads to trouble is a pegged rate system. Under a pegged rate system, a country commits itself to the maintenance of a specific exchange rate (or exchange rate range) relative to another currency (or a bundle of currencies). However, countries with pegged rates also continue to conduct an independent monetary policy. This leads to problems.

A nation can maintain full convertibility of its currency if it is willing to either (1) follow an independent monetary policy and allow its exchange rate to fluctuate or (2) tie its monetary policy to the maintenance of the fixed exchange rate. However, it cannot maintain the convertibility of its currency at the fixed exchange rate while following a monetary policy more expansionary than that of the country to which its currency is tied. Inevitably, this is what happens when such a country continues to conduct monetary policy. This regime is a little bit like a blind person walking down an alley with a number of manholes. Things may go smoothly for awhile, but eventually a crisis develops.

In order for a pegged rate system to work, a country must surrender its monetary independence and accept the monetary policy

of the country to which its currency is pegged. But this is precisely what nations seeking to peg their currencies are unwilling to do. Eventually, they follow a monetary policy that is too expansionary for the maintenance of the peg, leading to a financial crisis. This is what happened with Mexico during 1994-95. More recently, much the same thing happened in Brazil and several Asian countries (Thailand, South Korea, Indonesia and Malaysia). A pegged exchange rate regime is a bomb waiting to explode.

V. FREE TRADE, INCOME, AND GROWTH

The United States is a large free trade zone. This is an important factor that has contributed to the success of all Americans. Just as free trade within the U.S. promotes prosperity, so too, does international trade. When the residents of a country are permitted to buy from suppliers offering the best deal and sell to purchasers willing to pay the most attractive prices, they will be able to concentrate more of their resources on the things they do well (produce at a low cost), while trading for those they do poorly. As a result, they will be more prosperous.

In order to test the linkage between free trade and economic prosperity more rigorously, the staff of the Joint Economic Committee developed a Trade Openness Index. This index measures the degree to which citizens in various countries are free to exchange goods, services, and capital assets with residents of other countries. The index is based on four factors: (1) tariff rates, (2) presence or absence of a black market for foreign currency, (3) size of the trade sector as a share of the economy, and (4) restrictions on capital movements. High ratings are given to countries with low tariffs, no black market for foreign exchange, a large trade sector (given the country's size and locational characteristics), and few restrictions on the inflow or outflow of capital.⁵

It was possible to derive the index for 97 countries for the period 1980-1997. Table 3 lists the countries with the 12 highest and 12 lowest average ratings for openness during this 18-year period. The 12 most open economies had low tariffs, liberal currency conversion policies, large trade sectors, and few restraints on the inflow and outflow of capital. Hong Kong, Singapore, Belgium, Panama, Luxembourg, and Germany head the list; the United States ranks seventh, tied with the United Kingdom and the Netherlands. In contrast, the least open economies—Myanmar, Bangladesh, Sierra Leone, Burundi, Iran, Uganda, and Syria—persistently followed policies that restricted trade.

⁵ The four components of the index were weighted equally. The country data on tariffs; black market exchange rate premiums, the actual size of the trade sector relative to the expected size, and a categorical rating indicative of capital market restrictions were all placed on a 0 to 10 scale. For details, see James Gwartney and Robert Lawson, *Economic Freedom of the World: 2000 Annual Report* (Vancouver: Fraser Institute, 2000). The expected size of the trade sector is influenced by both country size and location. Thus, the model used to estimate the expected size of the trade sector is adjusted for size of country (population and geographic area) and locational characteristics (length of coastline and distance from concentrations of demand).

Table 3: Trade Openness, Income, and Growth

	Trade Openness Index (avg) 1980-97	Real GDP per person 1997	Average annual growth of real GDP per person 1980-97
<i>Most open economies</i>			
Hong Kong	9.9	\$26,150	4.7%
Singapore	9.8	\$30,756	5.8%
Belgium	9.0	\$23,763	1.7%
Panama	8.8	\$7,521	0.7%
Luxembourg	8.5	\$36,190	3.7%
Germany	8.5	\$22,693	1.6% *
United Kingdom	8.4	\$21,825	1.8%
United States	8.4	\$30,610	1.6%
Netherlands	8.4	\$22,717	1.6%
Switzerland	8.1	\$27,985	0.8%
Malaysia	7.9	\$11,274	4.2%
Canada	7.7	\$23,272	-1.2%
<i>Average</i>	<i>8.6</i>	<i>\$23,730</i>	<i>2.3%</i>
<i>Least open economies</i>			
Algeria	3.0	\$4,887	-0.9%
Madagascar	3.0	\$971	-2.2%
Nigeria	2.9	\$935	-0.9%
Argentina	2.8	\$10,600	0.4%
Ghana	2.8	\$1,913	-0.1%
Syria	2.4	\$3,182	1.0%
Uganda	2.4	\$1,117	2.2% *
Iran	2.0	\$6,206	-0.2%
Burundi	1.4	\$646	-1.2%
Sierra Leone	1.4	\$538	-3.9%
Bangladesh	0.6	\$1,117	2.4%
Myanmar	0.2	\$1,287	1.7%
<i>Average</i>	<i>2.1</i>	<i>\$2,783</i>	<i>-0.3%</i>

Sources: Trade openness (0-10 scale) derived by JEC staff. Data are from CIA, *Handbook of International Financial Statistics*; World Bank, *World Development Indicators, 1999*; IMF, *International Financial Statistics Yearbook, 1999*. GDP per person is in 1998 dollars, derived by purchasing power parity method.

Note: *Data for Germany are for West Germany only prior to unification. Due to data restrictions, Uganda's average annual growth is only since 1982.

If trade makes a difference, countries that are open over a long time should both achieve higher levels of income and grow faster. As Table 3 shows, this has indeed been the case. The GDP per person of the 12 most open economies in 1997 averaged \$23,730—eight times the average of \$2,783 for the 12 least open economies. The 12 most open economies grew, on average, 2.3 percent a year during 1980-97, compared to *minus* 0.3 percent a year for the 12 least open economies. The striking differences in both the income levels and growth rates illustrate the importance of international trade as a source of growth and prosperity.

A more detailed analysis of the 97 countries revealed that there was a strong positive relationship between both (1) openness and per capita GDP and (2) openness and rate of economic growth. Of course, economic performance is influenced by factors other than openness. In particular, institutions and policies that provide for more secure property rights and lead to persistent stability in the general price level are also important. These factors were also integrated into the analysis of the 97 countries in order to determine if openness exerts an independent impact. The results indicated that even after the positive effects of secure property rights and price stability were accounted for, the more open economies had higher income levels and achieved more rapid growth than those that were less open.

VI. CONCLUDING THOUGHTS

The U.S. experience indicates that openness and growth of the trade sector positively impact economic performance. International trade has grown from 13.5 percent of the U.S. economy in 1980 to 27.2 percent in 1999. Capital flows into and out of U.S. markets have grown even more rapidly. While there were some reductions in U.S. trade barriers—particularly on trade with Canada and Mexico—lower transport and communication costs, along with shifts toward more liberal trade policies by other countries, have been the driving forces underlying the growth of U.S. trade.

The unprecedented growth of international trade during the last two decades has been accompanied by:

- Growth of employment from 99 million in 1980 to 133.5 million in 1999, an increase of 35 percent;
- A reduction in the average unemployment rate from 7.3 percent in 1978-82 to 6.1 percent in 1988-92 and 4.9 percent in 1995-99;
- Price increases of both imports and exports that were well below those of the overall price level;
 - An 82 percent increase in real GDP;
 - Low and steady rates of inflation.

Of course, other factors—particularly the steady monetary policy of the Federal Reserve—deserve much of the credit for the low inflation and stable growth of recent years. But the growth of trade has also exerted a positive role. Economic theory indicates that international trade helps us get more out of our domestic resources. The U.S. experience during the last two decades is highly consistent with this view.

GLOSSARY

Appreciation: An increase in the value of a domestic currency relative to foreign currencies. An appreciation increases the purchasing power of the domestic currency for foreign goods.

Balance on current account: The import-export balance of goods and services, plus net investment income earned abroad, plus net private and government transfers. If the value of the nation's export-type items exceeds (is less than) the value of the nation's import-type items (plus net unilateral transfers to foreigners), a current-account surplus (deficit) is present.

Balance on goods and services: The exports of goods (merchandise) and services of a nation minus its imports of goods and services.

Balance of merchandise trade: The difference between the value of merchandise exports and the value of merchandise imports for a nation. When the imports exceed the exports, a merchandise trade deficit is present.

Balance of payments: A summary of all economic transactions between a country and all other countries for a specific time period, usually a year. The balance of payments reflects all payments and liabilities to foreigners (debits) and all payments and obligations received from foreigners (credits).

Capital account: Transactions with foreigners that involve either (1) the exchange of ownership rights to real or financial assets or (2) the extension of loans.

Comparative advantage: The ability to produce a good at a lower opportunity cost than others can produce it. Relative costs determine comparative advantage.

Depreciation: A reduction in the value of a domestic currency relative to foreign currencies. A depreciation reduces the purchasing power of the domestic currency for foreign goods.

Dumping: The sale of a good or service by a foreign supplier in another country at a price below the average total cost of production or the price charged by the supplier in its home market.

Exchange rate: The domestic price of one unit of foreign currency. For example, if it takes \$1.50 to purchase one English pound, the dollar-pound exchange rate is 1.50.

Exports: Sales of goods and services to foreign purchasers.

Flexible exchange rates: Exchange rates that are determined by the market forces of supply and demand. They are sometimes called floating exchange rates.

Fixed exchange rate: An exchange rate that is fixed relative to another currency (or bundle of currencies).

Foreign exchange market: The market in which the currencies of different countries are bought and sold.

Import quota: A specific limit or maximum quantity (or value) of a good permitted to be imported into a country during a given period.

Imports: Purchases of goods and services from foreign suppliers.

Net foreign investment: Purchases of real and financial assets by foreigners from Americans minus American purchases of these assets abroad.

Pegged exchange rate system: A commitment to use monetary and fiscal policy to maintain the exchange rate value of the domestic currency at a fixed rate or within a narrow band relative to another currency (or bundle of currencies).

Tariff: A tax levied on goods imported into a country.

Trade deficit: Situation when imports are greater than exports. Sometimes it is used when referring only to merchandise trade. In this manuscript, services, as well as goods, are included in the trade balance figures.

Trade surplus: Situation when the exports of goods and services are greater than the imports of these items.

Prepared by James Gwartney, Chief Economist to the Chairman; James Carter, Senior Economist; and Chuck Skipton, Economist.

This staff report expresses the views of the authors only and does not necessarily reflect those of the Joint Economic Committee, its Chairman, Vice Chairman, or its Members.

Openness, Growth, and Trade Policy

October 2000

**Joint Economic
Committee
Office of the Chairman,
Senator Connie Mack**

EXECUTIVE SUMMARY

1. Open international trade makes it possible for individuals to achieve higher living standards because it encourages (a) gains from specialization and trade, (b) innovation and efficient production, (c) a greater variety of goods, and (d) adoption of sound policies.

2. This report develops a Trade Openness Index (TOI) covering 1980-98 for 91 nations. Countries receive a higher TOI rating when they have low and relatively uniform tariffs, a fully convertible currency, few restrictions on the mobility of capital, and a large trade sector (given their size and location).

3. Hong Kong, Singapore, Belgium, Panama, Germany, United Kingdom, and Netherlands were the most open economies during 1980-98. The United States ranked tenth. At the other end of the spectrum, Myanmar, Bangladesh, Burundi, Iran, Sierra Leone, Syria and Algeria were the most closed economies.

4. Analysis using the TOI shows that persistently open economies have both higher GDP per person and faster growth than less open economies.

5. A one-unit increase in the TOI over a long period increases growth by 0.21 percentage points. This indicates that, for example, if India were as open as the United Kingdom, its economy would grow approximately one percentage point faster per year.

6. Openness is particularly important for developing economies and less populous nations.

7. Even though trade barriers are harmful to the economy, they are often politically popular because they can generate large gains for small but politically well-organized groups at the expense of consumers or taxpayers generally, who are not as well organized and for whom the cost per person from individual trade barriers is relatively small.

8. Protectionists often point to trade deficits as a reason to support their policies. However, U.S. trade deficits are primarily the result of capital inflows attracted by strong growth and sound policies. Like a rapidly growing business, a rapidly growing economy attracts external investment, creating a trade deficit. This is what has happened in the United States during the last two decades. It can continue without unfavorable consequences as long as we follow sound economic policies.

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The evidence is overwhelmingly persuasive that the massive increase in world competition—a consequence of broadening trade flows—has fostered markedly higher standards of living for almost all countries who have participated in cross-border trade. I include most especially the United States.

ALAN GREENSPAN
Speech on June 3, 1999

The world is getting smaller. Spurred by reductions in trade barriers and falling costs of transportation and communications, the volume of international trade has been growing rapidly. Approximately 21 percent of the world's total output is now sold in a different country than it was produced, double the figure of 1960.

There is near unanimity among economists that international trade exerts a positive impact on economic performance and helps people achieve higher income levels and living standards. Nonetheless, as indicated by demonstrations at the December 1999 meeting of the World Trade Organization in Seattle and other international gatherings since, openness to international trade continues to be controversial in many circles. Furthermore, many observers argue that the persistent trade deficits the United States has experienced in the last two decades endanger its future prosperity. Protectionists cite the trade deficit as a reason for imposing trade barriers. Does trade really promote prosperity and growth? How have open economies performed compared to those that are more closed? What accounts for the political popularity of trade restraints? Why has the United States experienced trade deficits in recent decades? Do they pose a danger to the U.S. economy? This report addresses those questions and related issues.

I. TRADE, INCOME LEVELS, AND ECONOMIC GROWTH

Trade is mutually advantageous: both trading partners expect to gain and they generally do. This expectation of gain provides the motivation for exchange. There are four major reasons why trade promotes growth and prosperity. First, trade permits individuals and nations alike to get more out of their resources. Trade makes it possible for individuals to specialize in the productive activities they do best and use the earnings from these activities to buy goods and services that they could produce only at a high cost. As a result,

trading partners produce a larger joint output and achieve a higher standard of living together than they could separately. Economists refer to this as the *law of comparative advantage*.

Most people recognize the validity of the law of comparative advantage as it applies to domestic trade. Each of the fifty U.S. states benefits from free domestic trade. It is easy to see that Michigan, for example, is better off specializing in the production of automobiles and using the revenues to purchase Florida oranges, Hollywood movies, Nebraska wheat, and Texas oil, rather than trying to be totally self-sufficient. The idea is equally valid for trade across national boundaries. The citizens of each nation can gain by spending more of their time and resources doing those things for which they have a relative advantage. If a good or service can be obtained more economically through trade, it makes sense to trade for it rather than to produce it domestically. It is a mistake to focus on whether a good is produced domestically or abroad. This is of little importance. The central issue is how the available resources can be used to obtain each good at the lowest possible cost.

Modern production of goods, ranging from pencils to computers, involves the cooperation of literally tens of thousands of people. International trade facilitates this cooperative effort. Trade makes it possible for people in different nations, with vastly different skills and resources at their disposal, to specialize in producing what they make most efficiently, while trading for items that would be costly for them to produce.

Second, open international markets encourage innovation and efficiency. Increasingly, economic growth involves brainpower, innovation, and the application of technology. Observation of and interaction with individuals employing different technologies often induces others to emulate successful approaches. Trade across regions and nations also encourages modifications that improve the original technology or make it more suitable for the local area. International competition also helps keep domestic producers on their toes and provides them with a strong incentive to improve the quality of their products. The experience of the U.S. automobile industry illustrates this point. Faced with stiff competition from Japanese firms during the 1980s, U.S. automobile makers worked hard to improve the quality of their vehicles. As a result, the reliability of the automobiles and light trucks available to American consumers—including those produced by domestic manufacturers—is almost certainly higher than would have been the case in the absence of competition from abroad.

Low price increases in international markets are a reflection of their dynamism and competitiveness. Between 1985 and the first

quarter of 1999, the general level of prices in the United States increased by 46.4 percent. During the same period, prices of imports rose only 4.2 percent, while prices of exports rose just 4.3 percent.

Third, international trade enhances living standards by making it possible for consumers to choose among a more diverse bundle of goods. When trade is stifled, the domestic market is often too small for firms to supply a broad set of goods at low cost. Increased openness helps producers expand the scale of their operations by competing in markets worldwide. That enables them to provide some goods that could not be profitably produced for a small domestic market. Measures of gross domestic product (GDP) ignore the welfare gains accompanying the availability of a broader selection of goods. Thus, GDP and its growth rate often understate the benefits from increased trade and a more open economy.

This process has been observable in Mexico, Argentina, China, and several Eastern European countries that liberalized trade during the last decade. As they liberalized, numerous goods that had previously been unavailable suddenly appeared in the marketplace. Most of them were commonplace in more open economies—items like pencil sharpeners, art supplies, transparent tape, video cameras, quality jeans, and personal computers. This expansion in the breadth of goods available improved the well being of people over and above the changes embodied in GDP figures.

Fourth, openness encourages countries to adopt sound institutions and policies. If countries do not, labor and capital move where they receive better treatment. For example, investors do not wish to place large sums in countries characterized by hostility toward business, monetary instability, legal uncertainty, high taxes, low-quality public services, arbitrary political intervention, or onerous labor regulations. When labor and capital are free to move elsewhere, it is costly to adopt policies that penalize success and exploit factors of production. Therefore, in addition to its direct effects, openness also provides political decision makers with a strong incentive to follow sensible policies. Even though this indirect effect is generally overlooked, it may well be one of the most beneficial attributes of an open economy.

II. CONSTRUCTION OF A TRADE OPENNESS INDEX (TOI)

Economic theory indicates that more open economies derive more output from their domestic resources, are more innovative and dynamic, and have more incentive to choose policies consistent with

investment and growth. Therefore, other things constant, open economies should be richer and grow faster than closed economies. To test this proposition, we developed a Trade Openness Index (TOI), which measures cross-country differences in the freedom of individuals to engage in international exchange. The index has four general components: (a) tariff rates, (b) the black-market exchange rate premium, (c) restrictions on capital movements, and (d) the actual size of the trade sector compared to the expected size. To earn a high score in the index, a country must have low and relatively uniform tariff rates, maintain a freely convertible currency, avoid restrictions that limit capital market transactions with foreigners, and avoid various types of non-tariff restraints (quotas, import licensing fees, and domestic buying requirements) that reduce the volume of international trade. Let us consider each component.

Tariff rates. Tariff data were obtained for various years from 1980-98. Three factors were incorporated into the tariff rating: the level of taxes on international trade as a share of the trade sector, the mean tariff rate, and the standard deviation of tariff rates. Higher ratings were assigned to countries with smaller revenues from taxes on international trade as a share of the trade sector, lower mean tariff rates, and a smaller standard deviation of tariffs. The data for each of these three dimensions were transformed to a 0-10 scale that reflects the actual data.¹

Black-market exchange rate premium. Exchange controls (currency controls) deter trade because they hinder people from acquiring currencies desired by trading partners abroad. When countries impose exchange controls and thereby restrict the convertibility of the domestic currency, a black market for foreign exchange emerges. The size of the black-market exchange rate premium is an indication of the restrictiveness of the controls. The

¹ In most cases, taxes on international trade were less than 15 percent of the trade sector (imports plus exports). Under our rating system, as the ratio rose from zero to 15 percent, the assigned rating declined from 10 (indicating no taxes on international trade) to zero (indicating taxes were equal to at least 15 percent of the trade sector). The mean tariff rate generally ranged from zero (no tariffs) to 50 percent (exceedingly high tariffs). As the mean tariff rate increased from zero to 50 percent or greater, the assigned rating fell proportionally from 10 to zero. As the standard deviation of tariff rates increased from zero (which indicates that a flat tariff rate applies to all imports) to 25 percent (or more), the rating declined proportionally from 10 to zero. For details, see James Gwartney and Robert Lawson, *Economic Freedom of the World, 2000* (Vancouver: Fraser Institute, 2000), Appendix 2.

higher the premium, the more difficult it is for residents to obtain foreign exchange for international trade, and therefore the more trade is blocked by the controls. Thus, countries with higher black-market premiums are less open and received a lower rating.²

Restrictions on capital movements. Restrictions on capital movements (purchase and sale of foreign financial assets) also reduce the volume of international exchange. Descriptive information on capital markets from publications of the International Monetary Fund was used to place countries in various categories and assign ratings of 0-10. The greater the restrictions on capital movements into and out of the country, the lower the country's rating.³

Size of the trade sector. Factors other than trade policy influence the size of a country's trade sector. The larger and more populous a country, the greater the opportunity for economies of scale within the domestic market. Countries with long coastlines may have lower transport costs that enhance their volume of international trade. Location relative to concentrations of world demand may also influence the size of a country's trade sector. To account for the last factor, we developed a Distance Adjusted Demand Scalar (DADS), which measures the relative distance of each country from the distribution of world demand.⁴

² As the black market premium rose from zero to 50 percent (and above), the assigned rating for this component fell proportionally from 10 (indicating full convertibility without restrictions) to zero.

³ If domestic investments by foreigners and foreign investments by citizens were unrestricted, a country received a rating of 10. When investments were restricted only in a few industries (for example banking, defense, and telecommunications), a country received a rating of 8. When investments were permitted, but regulatory restrictions slowed the mobility of capital, a country received a rating of 5. When domestic investments by foreigners or foreign investments by citizens required approval from government authorities, a country received a rating of 2. A rating of 0 was assigned when domestic investments by foreigners and foreign investments by citizens required government approval. For details, see James Gwartney and Robert Lawson, *Economic Freedom of the World, 2000*, Appendix 2.

⁴ The DADS variable for each country was derived by using the great-circle algorithm to adjust real purchasing power parity GDP for distance from the potential trading partners. Countries that have more than 99 percent of the world's GDP were used to derive the variable. The DADS provides an estimate for how close each country is to the mass of the world's GDP. It is large for countries close to centers of world demand. Several European countries (Luxembourg, Belgium, the Netherlands, etc.) are located most favorably relative to the distribution of the world's GDP, whereas New Zealand, Australia, Fiji, and Argentina are located least favorably. With

The population, geographic size, miles of coastline and DADS variables were incorporated into a regression equation and used to derive the expected size of the trade sector for each country. The regression was run across time periods and dummy variables were used to adjust for general changes in trade as a share of GDP through time. The country's actual trade sector was then compared with the expected size. A large actual size of the trade sector relative to the expected size suggests trade barriers are small. Thus, the larger the actual size relative to the expected, the higher the rating for this component.

The overall index. The overall index is simply the unweighted average of the four components. Again, a country can be rated from 0-10, depending on its scores for the four components.

III. MOST OPEN AND LEAST OPEN ECONOMIES: 1998 AND 1980-98

Figures 1 and 2 show TOI ratings for 1998 and for the whole period 1980-98. Data were available to construct a TOI for 109 countries for the year 1998, plus an average TOI for 91 countries for the period 1980-98.

A. Ratings in 1998

Figure 1 presents the ratings for 1998, ordered from highest to lowest. (An appendix of the original December 2000 Joint Economic Committee staff report presents the underlying data and ratings for each of the four components.) The 12 highest-ranked countries were Hong Kong, Singapore, Estonia, Belgium, Ireland, the Netherlands, Germany, Luxembourg, the United Kingdom, the Czech Republic, Costa Rica, Italy, and South Korea. The United States ranked 32nd, while Canada was tied with Peru and Norway for 33rd. Most members of the European Union ranked in the upper quarter of the distribution. At the other end of the spectrum, Myanmar, Sierra Leone, Iran, Burundi, Algeria, Syria, Papua New Guinea, Bangladesh, Croatia, and Albania were the least open and therefore lowest-ranked countries.

time, increasing trade in services and lower transport and communications cost may significantly reduce the importance of distance as a determinant of trade. However, regression analysis indicates that distance as measured by the DADS variable continued to exert a statistically significant impact on the size of the trade sector in the 1990s.

Figure 1: Trade Openness Index (1998)

Rank		TOI(1998)	Rank		TOI(1998)	Rank		TOI(1998)
1	Hong Kong	10.0	43	Mauritius	7.1	84	Cameroon	5.2
1	Singapore	10.0	43	Botswana	7.1	86	Malawi	5.1
3	Estonia	9.4	43	Latvia	7.1	86	Madagascar	5.1
4	Belgium	9.0	43	Bulgaria	7.1	86	Cyprus	5.1
5	Ireland	8.7	43	Malaysia	7.1	89	Russia	4.9
5	Netherlands	8.7	43	Ecuador	7.1	89	Pakistan	4.9
7	Germany	8.6	43	Namibia	7.1	91	Senegal	4.8
8	Luxembourg	8.4	43	Zambia	7.1	91	Nepal	4.8
8	UK	8.4	51	Greece	7.0	91	India	4.8
10	Czech Rep.	8.3	51	Guatemala	7.0	94	Brazil	4.7
10	Italy	8.3	51	Hungary	7.0	95	Niger	4.6
10	Korea	8.3	51	Kenya	7.0	95	Barbados	4.6
10	Costa Rica	8.3	51	Congo Rep.	7.0	97	Romania	4.5
14	Nicaragua	8.2	56	Domin. Rep.	6.9	98	Cen. Afr. Rep.	4.3
14	Sweden	8.2	57	Iceland	6.8	99	Tanzania	4.2
16	Switzerland	8.1	57	Chile	6.8	100	Albania	4.0
16	Spain	8.1	59	Trinidad-Tob.	6.6	101	Croatia	3.9
16	Philippines	8.1	59	South Africa	6.6	102	Bangladesh	3.8
19	Austria	8.0	59	El Salvador	6.6	103	Pap. N. Guinea	3.5
19	Panama	8.0	59	Venezuela	6.6	104	Syria	3.3
19	Lithuania	8.0	59	Oman	6.6	105	Algeria	2.8
22	Australia	7.9	64	Jordan	6.5	106	Burundi	2.3
22	Denmark	7.9	64	Jamaica	6.5	107	Iran	1.7
22	Israel	7.9	64	Japan	6.5	108	Sierra Leone	1.3
22	China	7.9	67	Poland	6.4	109	Myanmar	0.0
22	Mexico	7.9	68	Kuwait	6.3			
27	Finland	7.8	68	Egypt	6.3			
27	Paraguay	7.8	68	Slovenia	6.3			
27	Bolivia	7.8	68	Bahrain	6.3			
27	Portugal	7.8	68	Ukraine	6.3			
27	New Zealand	7.8	73	Indonesia	6.2			
32	USA	7.7	74	Fiji	6.1			
33	Peru	7.5	75	Colombia	6.0			
33	Canada	7.5	75	Sri Lanka	6.0			
33	Norway	7.5	75	Malta	6.0			
36	Honduras	7.4	78	Ivory Coast	5.9			
36	Uruguay	7.4	79	Turkey	5.8			
38	Argentina	7.3	80	Belize	5.7			
39	Taiwan	7.2	81	Tunisia	5.6			
39	Slovak Rep.	7.2	81	Zimbabwe	5.6			
39	Thailand	7.2	83	Morocco	5.4			
39	France	7.2	84	Mali	5.2			

The United States ranks higher (tenth) when the entire 1980-98 period is considered. Even though its openness *rating* changed very little between 1980 and 1998, its *ranking* fell because the ratings of several other countries rose substantially. The TOI indicates that the United States is a relatively open economy but it is not, as some have argued, an island of free trade in a protectionist world. The details are consistent with this view. Tariffs imposed by the United States are similar to those of other OECD countries. The United States imposes highly restrictive quotas on several products, including sugar and peanuts. Foreigners are not allowed to compete in the domestic air service market. The Jones Act limits competition in the water transport industry. The recently passed Byrd Amendment will limit competition by encouraging domestic producers to file charges of “dumping” against foreign rivals. The U.S. record is not without blemishes.

B. Ratings During 1980-98

Current trade policy may be a misleading indicator of openness over a long period. The structure of trade policy over time is important, because it takes time for markets to adjust to changes in the openness of an economy and for the changes to acquire credibility. Initially, decision makers may be unsure whether a policy change is temporary or permanent. Until credibility is achieved, the response of traders, entrepreneurs, investors, and other decision makers will be limited.

As policies of openness persist, however, decision makers eventually should become convinced that the more liberal policies will persist. As this happens, the adjustments stressed by economic theory should come into play. Trade should increase and resource should begin to move toward the production of goods and services that can be supplied domestically at low cost and away from those that can be supplied only at high cost. In addition, trade should stimulate innovation and adoption of ideas that have been successful elsewhere. These adjustments should promote output and growth in the more open economies.

To test the validity of this theory, we need an index of persistent openness, that is, openness over a lengthy period. Figure 2 shows such an index. To develop the index, we assembled data and derived the TOI for the periods 1980-82, 1985-87, 1990-92, and 1995-97. The three-year time intervals of these estimates reduce the likelihood that an unusual change or temporary aberration during a single year will distort a country's rating. The ratings for these four periods were used,

Figure 2: Trade Openness Index (1980-98)

Rank	TOI(1980-98)	Rank	TOI(1980-98)	Rank	TOI(1980-98)			
1	Hong Kong	9.9	31	South Africa	6.3	61	Cyprus	4.7
2	Singapore	9.8	31	Philippines	6.3	61	Guatemala	4.7
3	Belgium	9.1	34	Jordan	6.2	61	Colombia	4.7
4	Panama	8.8	34	Israel	6.2	65	Cameroon	4.6
5	Germany	8.5	36	Botswana	6.1	66	Peru	4.5
5	UK	8.5	36	Indonesia	6.1	66	Belize	4.5
7	Netherlands	8.4	38	Fiji	5.9	68	Trinidad-Tob.	4.4
8	Luxembourg	8.3	39	Congo Rep.	5.8	68	Barbados	4.4
9	Switzerland	8.0	40	Greece	5.6	70	Malawi	4.3
10	USA	7.8	40	Jamaica	5.6	70	Senegal	4.3
10	Malaysia	7.8	40	Mexico	5.6	70	Domin. Rep.	4.3
10	Sweden	7.8	43	Malta	5.5	73	Niger	4.2
13	Ireland	7.7	44	Costa Rica	5.4	74	Cent. Afr. Rep.	4.0
14	Canada	7.6	44	Bolivia	5.4	74	El Salvador	4.0
15	New Zealand	7.5	46	Iceland	5.3	74	Egypt	4.0
15	Norway	7.4	46	Mauritius	5.3	74	Nicaragua	4.0
15	Italy	7.4	46	Morocco	5.3	78	Pakistan	3.9
18	Spain	7.3	46	Kenya	5.3	79	Nepal	3.7
19	Taiwan	7.2	50	Paraguay	5.2	80	India	3.5
19	Australia	7.2	50	China	5.2	81	Brazil	3.4
21	Denmark	7.1	52	Ivory Coast	5.0	82	Argentina	3.3
21	Austria	7.1	53	Ecuador	4.9	83	Tanzania	3.2
23	Uruguay	7.0	53	Mali	4.9	84	Madagascar	3.1
24	Portugal	6.9	53	Sri Lanka	4.9	85	Algeria	2.9
25	Finland	6.7	56	Zambia	4.8	86	Syria	2.5
26	Korea	6.6	56	Zimbabwe	4.8	87	Sierra Leone	1.9
26	Venezuela	6.6	56	Honduras	4.8	87	Iran	1.9
28	Japan	6.5	56	Hungary	4.8	89	Burundi	1.5
28	France	6.5	56	Turkey	4.8	89	Bangladesh	1.5
30	Thailand	6.4	61	Tunisia	4.7	91	Myanmar	0.1
31	Chile	6.3						

Note: The TOI (1980-98) represents a weighted mean of the trade openness index from 1980-2, *1985-7, 1990-2, 1995-7, and 1998, with the 1998 observation receiving a one-half weight as to not overrepresent the 1990s in the overall period average.

along with the 1998 figure, to estimate the average TOI during 1980-98. (Because they cover a shorter period, 1998 data were weighted half as much as the data for each of the other four periods.)

Figure 2 presents the average TOI rating during 1980-98 for each of the 91 countries for which data were available. (An appendix of the original December 2000 Joint Economic Committee staff report contains the country ratings for each of the five shorter periods.) The top-rated countries of Figure 2 had persistently high ratings over time, while those at the bottom had persistently low ratings. Hong Kong, Singapore, Belgium, Panama, Germany, the United Kingdom, the Netherlands, Luxembourg, and Switzerland headed the list. The United States ranked tenth, tied with Malaysia and Sweden. Ireland ranked 13th, followed closely by Canada, New Zealand, Norway, and Italy.

At the other end of the spectrum, Myanmar, Bangladesh, Burundi, Iran, Sierra Leone, Syria and Algeria were the least open economies during 1980-98. Argentina, India, Nepal, Pakistan, and Egypt also had low average ratings for the period.

IV. TRADE OPENNESS, INCOME LEVELS, AND GROWTH: EVIDENCE

If trade makes a difference, countries with persistently high openness ratings should be richer and grow faster than those with low ratings. As Table 1 shows, this was indeed the case. The \$23,387 average GDP per person of the 12 most open economies was more than seven times the average of \$3,250 for the 12 least open economies. (Germany was excluded from this and much of the subsequent analysis because of difficulties in comparing certain statistics before and after its 1990 reunification.) GDP per person in the 12 most open economies grew an average of 2.5 percent a year during 1980-98, compared to 0.3 percent a year in the 12 least open economies. All of the 12 most open economies had positive growth rates and all but one grew at an annual rate of 1.2 percent or more. In contrast, four of the 12 least open economies had reductions in GDP per person and only four achieved growth above 1 percent a year. These differences suggest that openness exerts a major impact on growth and prosperity.

Table 1: GDP per Person and the Growth of Nations with the Highest and Lowest 1980-98 Trade Openness Indexes

Country	TOI (1980-98)	Real PPP GDP per person 1998	Average annual growth rate of real GDP* per person 1980-1998
Hong Kong	9.9	\$24,120	4.1%
Singapore	9.8	\$30,621	5.2%
Belgium	9.1	\$24,415	1.8%
Panama	8.8	\$7,705	1.5%
UK	8.5	\$22,258	1.7%
Netherlands	8.4	\$23,444	1.6%
Luxembourg	8.3	\$37,795	2.5%
Switzerland	8.0	\$28,493	0.9%
USA	7.8	\$31,485	1.6%
Malaysia	7.8	\$10,187	3.4%
Sweden	7.8	\$20,852	1.2%
Ireland	7.7	\$19,267	4.3%
Top 12:	8.5	\$23,387	2.5%
India	3.5	\$1,831	3.7%
Brazil	3.4	\$6,560	0.4%
Argentina	3.3	\$10,877	0.5%
Tanzania	3.2	\$709	-0.1%
Madagascar	3.1	\$978	-2.6%
Algeria	2.9	\$5,033	0.1%
Syria	2.5	\$3,258	1.3%
Sierra Leone	1.9	\$530	-3.3%
Iran	1.9	\$6,209	0.1%
Burundi	1.5	\$527	-1.4%
Bangladesh	1.5	\$1,155	1.8%
Myanmar	0.1	\$1,333	3.3%
Bottom 12:	2.4	\$3,250	0.3%

Notes: Germany is omitted from this analysis due to discontinuity in the income data resulting from unification.

* Real GDP data are in 1998 U.S. dollars and are calculated using the purchasing power parity method.

A. The Link Between Openness and Income: Quintile Analysis

Figure 3 illustrates the link between openness and both the level and growth rate of GDP per person for the entire set of 90 countries with 1980-98 TOI ratings. The countries were arrayed from highest to lowest based on their average rating and the distribution was divided into quintiles of 18 countries.

As the top frame of Figure 3 shows, the quintile with the highest TOI ratings had an average GDP of \$22,306 per person, more than 60 percent greater than the level of the second-highest quintiles. A similar relationship existed between each of the lower quintiles and the quintile below it. Clearly, there was a strong relationship between long-term openness and GDP per person.

The bottom frame of Figure 3 illustrates the relationship between the 1980-98 average TOI rating and the annual growth rate of real GDP per person during the same period. The top quintile achieved average growth of 2.4 percent a year during 1980-98, versus 2.0 percent for the second quintile, 1.3 percent for the third quintile, and only 0.5 percent for the two lowest quintiles. These figures suggest that more open economies achieve higher economic growth.

B. The Link Between Openness and Income: Regression Analysis

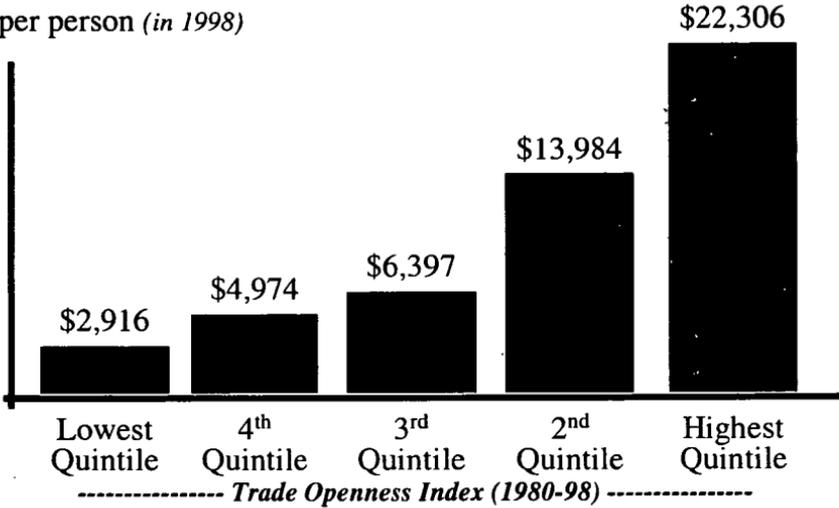
Table 1 and Figure 3 show a strong positive relationship between trade liberalization as measured by the TOI index on the one hand and both the level and growth of GDP per person on the other hand. However, they do not provide information on the statistical significance of the relationships, nor do they reveal whether openness exerts an independent impact. We now investigate these issues.

Factors other than openness influence income levels and growth rates. Economic theory and empirical research indicate that the stability of the price level and security of property rights are two key policy variables that influence economic performance. Measures of cross-country differences for these two variables were developed for the 90 countries with TOI ratings for 1980-98. The measure of price level variability was the average standard deviation of the inflation rate for five-year periods during 1980-98. The property rights variable is the rule of law rating from the PRS Group *Country Risk Guide*, which has provided ratings since 1982. We averaged ratings for 1982,

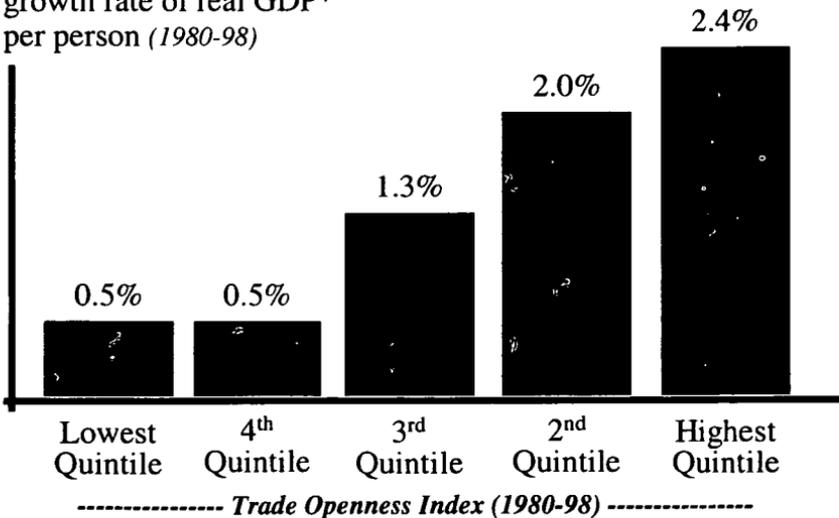
Figure 3: Trade Openness, Income, and Growth

Real GDP*

per person (in 1998)



Average annual
growth rate of real GDP*
per person (1980-98)



Note: * Real GDP figures are calculated using the purchasing power parity method and are in 1998 U.S. dollars.

1985, 1990, 1995, in 1998 to derive each country's rating for 1980-98. Both variables were converted to a 0-10 scale.⁵

Table 2 uses a regression to investigate the link between trade openness, variability of inflation, and the security of property rights on the one hand and 1998 GDP per person on the other. The first two equations are for all 90 countries for which we were able to derive the TOI for the 1980-98 period. As Equation 1 shows, the simple relationship between TOI and per capita GDP is exceedingly strong. The R-squared indicates that the TOI alone explains 55 percent of the cross-country variation in 1998 GDP per person. Equation 2 adds the inflation variability and property right variables into the model. All three of the variables are significant at the 95 percent level of confidence or higher and the R-squared indicates that the model explains 78 percent of the cross-country variation in 1998 GDP per person.

Some argue that rich countries are in a better position than poor countries to reduce trade barriers. According to this view, the relationship illustrated by Equations 1 and 2 runs from wealth to openness. To shed light on this view, the 21 countries (including Germany) that the World Bank classified as "high-income industrial" in 1980 were deleted from the data set, leaving 70 countries. Equations 3 and 4 of Table 2 show that even after omitting the high-income countries, the TOI continues to explain a large share (42 percent in the simple model) of the cross-country variation in GDP per person. In the three-variable model of Equation 4, both the TOI and the rule of law variables remain significant, but the inflation variable does not. This indicates that some of the explanatory power of inflation variability observed in Equation 2 stems from its correlations with high-income status.

As we have said, it is more important for small countries than for larger ones to maintain open economies. Equations 5 and 6 only include the 66 countries in our database that had fewer than 20 million people in 1980. The R-squares for these equations are larger than for the parallel equations for the complete set of countries and for low- and middle-income countries. This is consistent with the view that openness is more important for smaller countries. The three-variable model of Equation 6 explains 80 percent of the variation in GDP per person across countries. Once again, the significance of both the

⁵ For details, see James Gwartney and Robert Lawson, *Economic Freedom of the World, 2000*.

openness and rule of law variables remains high, while the inflation variable continues to be insignificant at acceptable levels of confidence.

Table 3 focuses on growth; the dependent variable for all equations is the average annual growth rate of GDP per person during 1980-98.⁶ In addition to openness, price stability and country size (both population and area) are included in the more comprehensive model. The rule of law variable is not included here because it was not significant in any of the equations. Population and area are included primarily as control variables. A larger population may create greater opportunity to realize economies of scale within the domestic market. Thus, we expect the sign of this variable to be positive. The sign of the area variable is more ambiguous. The observed negative sign may indicate that transaction costs in the domestic market are higher when the population is spread over a larger area.

Equation 1 of Table 3 looks at the simple relationship between the TOI measure of openness and the growth rate of real GDP per person during 1980-98 for the entire data set of 90 countries. The t-ratio for the TOI is highly significant and the R-squared indicates that openness explains 12 percent of the cross-country variation in growth. When the inflation variability, population, and area variables are added to the model (Equation 2), all of the variables are significant at the 95 percent level or higher and the explanatory power of the model increases to .35.

The coefficient of the openness variable (0.21) indicates that a one-unit change in the TOI, if maintained over a long period, would increase long-term growth by 0.21 percentage points a year. This is a sizeable amount: a country like India, which had a TOI rating of 3.5 during 1980-98, could increase its long-term growth by about 1 percentage point annually if it were as open as Germany and the United Kingdom, countries with TOI ratings of 8.5 during 1980-98.

Some have argued that the relationship between openness and growth merely reflects that high-income countries are more open and that they also grow more rapidly. Thus, the relationship may be spurious. To see if this is the case, we once again omitted the high-

⁶ For a recent analysis of the link between international trade and growth, see Jeffrey A. Frankel and David Romer, "Does Trade Cause Growth?" *American Economic Review*, June 1999, pp. 379-99.

Table 3: Trade Openness, Monetary Stability, Size, and Income Growth

	Dependent variable --- Annual growth rate of real GDP ^a per person					
	<i>(t-statistic is in parenthesis)</i>					
	Complete set (90 countries)		Low- and middle-income countries		Small-population countries (<20 million in 1980)	
	(1)	(2)	(3)	(4)	(5)	(6)
Trade Openness Index (1980-98)	0.38 (3.69)*	0.21 (2.07)**	0.46 (3.26)*	0.35 (2.89)*	0.61 (5.80)*	0.39 (3.82)*
Inflation variability rating		0.30 (3.67)*		0.34 (3.71)*		0.31 (3.82)*
Log of population in 1980 (in millions)		0.50 (3.45)*		0.69 (3.83)*		-0.01 (0.05)
Log of land area (in 1000s of sq. kilometers)		-0.29 (2.55)**		-0.33 (2.27)**		-0.19 (1.77)***
Intercept	-0.78	-1.47	-1.12	-2.90	-2.42	-1.73
n	90 ^b	90 ^b	70 ^c	70 ^c	66 ^d	66 ^d
Adj R-squared	.12	.35	.12	.43	.33	.51

* significant at 99th level** significant at 95th level*** significant at 90th level^a Real GDP numbers are derived using the purchasing power parity (PPP) method and are in 1998 U.S. dollars.^b Complete set includes countries listed in Fig. 2, except Germany which was omitted because of discontinuity in data resulting from unification.^c There are 70 low- and middle-income countries. Countries classified as high-income industrial by the World Bank in 1980 were omitted.^d There are 66 small-population countries (fewer than 20 million people in 1980).

income industrial economies and re-ran the model. Doing so exerted little impact on the simple relationship between openness and growth (Equation 3 versus Equation 1). As Equation 4 shows, all of the variables remain significant and have the expected sign. Both the t-ratio for TOI and the R-squared for the broader model increased when the high-income countries were omitted. Furthermore, the size of the openness coefficient increased from 0.21 in Equation 2 to 0.35 in Equation 4. This indicates that openness actually exerts a larger impact on the growth of developing countries than on the growth of high-income industrial nations.

Equations 5 and 6 apply the growth model to small countries (population less than 20 million). The results are similar to those for developing countries (Equations 3 and 4). In the broad model, the TOI remains significant at the 99 percent level. The TOI coefficient of 0.39 indicates that for small countries, a one-unit change in the openness measure is associated with an increase of 0.39 percentage points a year in long-term growth. Just as we had expected, this suggests that open trade is particularly important for small countries. The R-squared of Equation 6 indicates that TOI and inflation variability, along with the size variables (population and area) explain 51 percent of the variation in growth of per capita GDP over the 1980-98 period. Except for population, all of the variables are significant. The compression of the population measure for this data set undoubtedly contributed to its insignificance.

The results indicate that economies that remain open over long periods grow faster and achieve higher levels of income per person than more closed economies. Openness continues to exert a positive independent impact on economic performance even after taking account through control variables of the effects of inflation variability, rule of law (when significant), and country size. Furthermore, the results are robust. The positive impact of openness holds for developing countries and small countries, as well as for the entire set of 90 countries. In fact, the positive effects are somewhat larger for developing economies and small countries than for the entire data set.

V. WHY OPEN TRADE IS DIFFICULT TO MAINTAIN

A. Protectionism and Special Interests

Economic theory indicates that open economies grow more rapidly and achieve higher levels of income than those that are more closed.

As we have shown, strong evidence supports this proposition. There is also evidence that more liberal trade policies, lower transport costs, and technological advances have stimulated the volume of international trade in recent decades.

Despite these trends, vocal demands for protectionist policies continue. Why is this so? The answer is straightforward: restrictive trade policies are a special-interest issue. They often provide sizeable benefits to well-organized industrial and labor interests at the expense of consumers and taxpayers. The latter two groups are often politically unorganized and the costs of the restrictive policies are typically spread broadly but thinly and difficult to identify. As a result, consumers and taxpayers generally ignore protectionist policies. In contrast, the beneficiaries of trade restraints often derive sizeable personal gain. These gains will motivate them to supply politicians not only with votes, but campaign funds and other political perks. Thus, politicians can often gain by catering to their views even when the restrictive policies are harmful to the economy.

The U.S. sugar program vividly illustrates how the process works. Americans pay about twice the world price for sugar because domestic sugar growers and makers of corn syrup, a sugar substitute, have lobbied the government to impose import quotas that keep low-cost foreign sugar out of the United States. The cost to consumers is estimated at about \$3 billion a year. For the fewer than three-dozen firms that are the big beneficiaries of the sugar program, the benefits from restricting trade are in the tens or even hundreds of millions of dollars per firm. It is worthwhile for the sugar lobby to spend millions of dollars defending its privileges. For an average family of four, though, the average savings from lower-cost sugar would be perhaps \$60 a year. It is not worthwhile for consumers to spend time or effort to lobby Congress over such a small amount per family.⁷ Hence the U.S. government prevents free trade in sugar even though it is in the best interest of American consumers.

The same happens with regard to other goods and services, which explains why trade restrictions are imposed and why governments find it so difficult to remove them even though doing so is in the general interest. There is a conflict between sound economics and winning politics here. This is why it is vitally important for Americans to understand this issue and remain vigilant in the pursuit of open markets and the benefits they provide.

⁷ See James Bovard, "Archer Daniels Midland: A Study in Corporate Welfare," *Cato Institute Policy Analysis* 241, September 26, 1995.

B. A Diversionsary Tactic: Environmental and Labor Standards

In recent years, proponents of trade restrictions have tried to tie trade issues together with labor and environmental standards. This is a diversionsary tactic that reflects the weakness of the intellectual case for protectionism. It would be a colossal mistake for the World Trade Organization (WTO), an entity designed to promote open markets, to shift its focus away from this objective toward regulating labor and environmental standards. Other organizations, notably the International Labor Organization and the United Nations Environmental Program, already exist as forums for handling those issues.

Understandably, low-income countries resent attempts by the United States and other high-income countries to impose labor and environmental regulations on their economies. They recognize that these efforts are often nothing more than attempts to increase the production costs of their firms. They regard such attempts as hypocritical because their labor and environmental standards are much like those the United States had a century ago, when it had a similar level of income per person.

If we want to improve the environmental policies and labor standards of low-income countries, the best thing we can do is trade with them and thereby make it possible for them to achieve higher incomes. Pressuring developing countries to adopt our labor and environmental standards prematurely may actually impede their advance toward the standards by slowing their economic growth. Most already have met or are striving to meet minimum standards governing such areas as prohibition of forced labor and cross-border pollution. As they grow richer, their own citizens will want them to have standards more like ours. We achieved high environmental and labor standards through economic growth. Why should we expect today's low-income countries to choose a different path?

VI. THE ECONOMICS OF TRADE DEFICITS

Besides protectionism, another obstacle to trade openness is fear of trade deficits. A nation runs a trade deficit when it imports more than it exports. During the last 25 years, the United States has persistently run large trade deficits. Reflecting their view that exports are good and imports bad, protectionists often argue that trade deficits are bad for the economy. One must keep in mind that trade is a

positive-sum activity. Both buyer and seller gain. This provides the motivation for exchange. Thus, both imports and exports are good. Imports are good because they make it possible for buyers to obtain goods more economically than would otherwise be the case. Exports are good because they provide sellers with revenues to purchase other things.

The trade balance reflects millions of choices by both Americans and foreigners about where and how much they will buy, save, and invest. There is a natural tendency to think that a trade deficit is bad. The tendency is understandable: the word “deficit” suggests things like excessive spending relative to income, bank overdrafts, indebtedness, and a future day of reckoning. Trade deficits, however, are not like other deficits. They often occur because an economy is growing more rapidly than its trading partners. Rapid domestic growth stimulates imports, while slow growth abroad weakens demand for a nation’s exports. This combination often causes a trade deficit.

Trade deficits may also arise because the economic environment of a nation is highly attractive to both domestic and foreign investors. When that is the case, a capital inflow will increase the demand for the domestic currency, causing it to appreciate on the foreign exchange market. In turn, the appreciation will stimulate imports relative to exports, causing a trade deficit. Both strong growth and an attractive investment environment have contributed to the trade deficits the United States has experienced during the last two decades.

A. The Link Between Capital Inflows and Trade Deficits

Much of the confusion about trade deficits stems from a failure to recognize the link between inflows of capital and the size of the trade deficit. A floating exchange rate, such as the United States has, brings total sales to foreigners into balance with total purchases from foreigners. This means that a country’s current account (trade in goods and services) plus its capital account (trade in financial assets) must sum to zero. As a result, the following relation must hold:

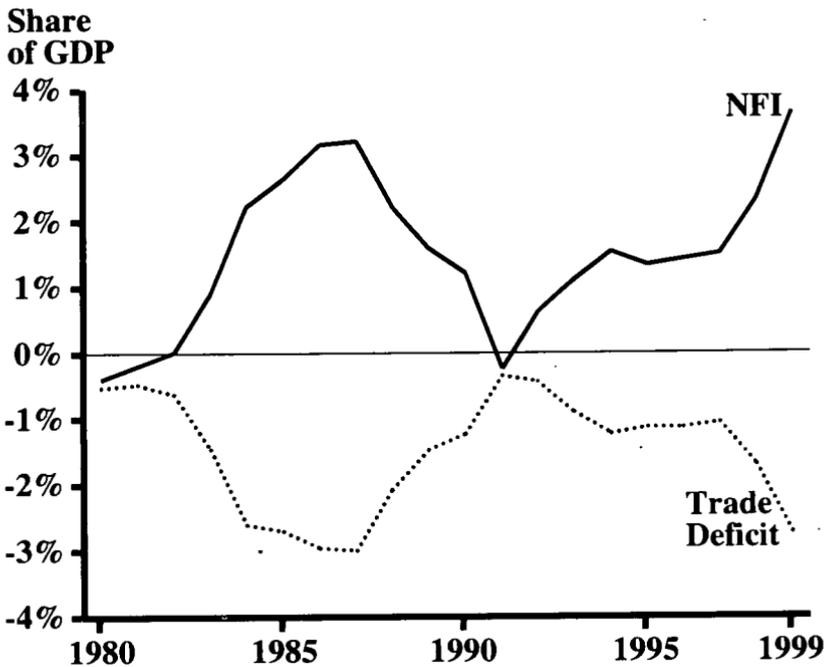
$$\text{Exports} + \text{Net Foreign Investment} = \text{Imports}^8$$

Therefore, when foreigners invest heavily in a country—when there is a net inflow of capital—a trade deficit (current-account deficit) will occur.

The link between capital inflow and trade deficits is not just an equation in textbooks. As Figure 4 (next page) shows, it occurs in the real world. Net

⁸ This formula omits investment income and unilateral transfers, which are small in the case of the United States.

Figure 4: The Trade Deficit and Net Foreign Investment (NFI) as a Share of U.S. GDP



Source: Haver Analytics; *Economic Report of the President*, 2000, b-22.

foreign investment (net inflow of capital) and the trade deficit are almost mirror images. When net foreign investment increases, demand for the U.S. dollar rises in foreign exchange markets, making the dollar appreciate. This appreciation stimulates imports relative to exports, causing a trade deficit. The opposite happens when there is an outflow of capital: the dollar depreciates, exports are stimulated relative to imports, and the trade balance shifts toward a surplus.

When an economy is an attractive place to invest, opportunities for investment may exceed domestic saving. In an open economy, foreign investment fills the gap. Thus, a net inflow of capital and an accompanying trade deficit can also be viewed as a shortfall between domestic saving and the level of investment.

Once the link between a net inflow of capital and a trade deficit is recognized, the fact that strong economies often experience trade deficits while stagnating economies often have trade surpluses is no longer a puzzle. Growing economies offer attractive investment opportunities that lead to an inflow of capital, currency appreciation, and sizeable trade deficits. This is precisely what has happened in the United States during the Great Expansion our economy has enjoyed since late 1982. Price stability, smaller government, lower taxes, and

open trade policies have created an attractive environment for investment. This has led to an inflow of capital that resulted in a trade deficit, but more important, the capital spending also enhanced productivity and living standards. Far from indicating economic weakness, the trade deficit has reflected strength.

B. Are Trade Deficits Sustainable?

Are our present trade deficits like business losses: will they soon have to be terminated? Perhaps surprisingly, the answer is "No." Remember that trade deficits are the other side of the coin from net inflows of capital, which are likely to continue as long as the United States follows sound policies that create an attractive environment for investment. In turn, foreigners will be happy to supply investment capital as long as they can earn competitive returns. There is no reason why the process cannot continue for many years.

Historical evidence is consistent with this view. The United States experienced trade deficits and capital inflows year after year from 1820 to 1870. During that period, investment opportunities in the New World were more attractive than those in Europe, so Europeans were willing to continue financing undertakings in the New World.

The financing of a growing business provides insight on the relationship between growth, capital inflow, and the sustainability of trade deficits. If a business is growing slowly, the owner may choose to finance capital expansion entirely with internal savings. When a business is growing rapidly, however, its investment opportunities generally exceed its internal financing capabilities. Rapidly growing businesses invariably resort to some external financing. Furthermore, as long as the firm is able to earn an attractive rate of return on investment, the growth of external financing can continue indefinitely. The situation is the same for a nation. When the environment for growth and investment is attractive, there may well be a shortfall between domestic investment and savings. Just as a shortfall of investment relative to internal financing does not limit the growth of a firm, neither does a shortfall of domestic savings relative to opportunities for profitable investment limit the growth of a nation.

C. Trade Deficits and Indebtedness to Foreigners

Critics often argue that trade deficits increase the indebtedness of Americans to foreigners. They point out that the assets owned by foreigners in the United States currently exceed those Americans own abroad by approximately \$2 trillion. When considering the

significance of this charge it is important to keep several points in mind. First, \$2 trillion is only 5 percent of the total value of U.S. assets. Second, approximately half of the foreign investment is in the form of equity (stocks, land, and direct ownership of business assets). No debt obligation accompanies the foreign ownership of these assets. Americans benefit from direct investments by foreigners and from selling assets to foreigners at attractive prices.

Of course, some foreign investments are in the form of loans or the purchase of bonds. But this results in lower interest rates for Americans. If the investments are sound, they will generate a future income stream that is more than sufficient to repay the loans. Even in this case, the loans are helpful to the U.S. economy. The bottom line is that both debt and equity investments increase foreign ownership, but they also increase capital formation, worker productivity, and the living standards of Americans. Policies that would reduce foreign investment would also reduce the benefits it brings.

Some fear that the growth of foreign investment makes the United States vulnerable to a sudden sale of assets and withdrawal of funds by foreigners. When considering this argument, it is important to recognize that foreign and domestic investors are influenced by the same considerations. Anything that would cause foreigners to withdraw funds would cause domestic investors to do likewise. In fact, the vulnerability runs the other way. If foreign investors left, the assets financed by their funds would remain. Thus, they are in a weak position to impose harm on the U.S. economy.

D. Trade Deficits and Employment

Critics of trade also often argue that trade deficits mean the loss of jobs. Once the link between the inflow of capital and trade deficits is recognized, the error of this view is obvious. The inflow of capital that must accompany a trade deficit will lead to lower interest rates and a higher level of investment. Any loss of jobs accompanying the excess of the imports relative to exports will be offset by higher employment due to the lower interest rates and more investment. U.S. experience during the Great Expansion illustrates this. Even though imports grew more rapidly than exports and trade deficits were sizeable throughout much of the period, total employment increased by 35 million from 1983 to 1999 and the unemployment rate fell to a 30-year low. Simply put, the protectionist view that trade deficits reduce employment is not supported by economic theory or evidence.

E. What Should We Do About the Trade Deficit?

A trade deficit is quite different from a business loss or even the budget deficit of a government. No legal entity is responsible for the trade deficit.⁹ It is not something that one party owes to another; it is merely the sum of the buying and selling decisions of millions of individuals that will both reap the benefits and bear the costs of their choices.

The best thing policy makers can do is focus on keeping the U.S. an attractive place to invest. That means having price stability, free trade, low taxes, and restraints on the growth of government. If we have these basics right, we should not worry about the trade deficit, because the inflow of foreign capital reflects the attractiveness of the United States as a place to invest and boosts our economic growth. To the extent we need to be worried, the focus should be on our relatively low savings rate rather than on the trade deficit. The U.S. tax system discriminates against saving and favors current consumption. Eliminating this discrimination would lead to both more domestic savings and a smaller trade deficit.

VII. SUMMARY AND CONCLUSIONS

The major findings of this report are:

- Economic theory indicates that open trade makes it possible for individuals and businesses to specialize more fully in those things they do best. Openness also encourages innovative and entrepreneurial activities. Thus, one would expect open economies to grow more rapidly and achieve higher levels of income.

- To investigate the impact of openness on economic performance, a Trade Openness Index (TOI) was constructed for both 1998 and the 1980-98 period. The TOI measures the extent that a country has a fully convertible currency (no black-market exchange rate), low and relatively uniform tariffs, few restrictions on capital movements, and a large trade sector (given its size and location).

⁹ In his typical satirical manner, the late Herbert Stein wrote: "The trade deficit does not belong to any individual or institution. It is a pure statistical aggregate, like the number of eggs laid in the U.S. or the number of bald-headed men living here." Herbert Stein, "Leave the Trade Deficit Alone," *Wall Street Journal*, March 11, 1987.

- The TOI indicates that Hong Kong and Singapore are the world's most open economies. The United States ranked tenth (with Sweden and Malaysia) during the 1980-98 period.

- Using the TOI to analyze the impact of cross-country differences in openness on growth and income shows that countries with persistently open trade sectors achieve higher levels of income per person and grow more rapidly.

- Openness is difficult to maintain because protectionist policies are a special-interest issue. They tend to generate large individual gains for small but well-organized groups at the expense of costs that are spread across larger but unorganized groups of consumers or taxpayers. Thus, even though they are harmful to the economy, they are politically difficult to resist.

- Economics indicates that the trade deficit is primarily the result of capital inflow attracted by the strong growth and sound policies of the last two decades. Contrary to the views of protectionists, there is little reason to worry about it.

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This staff report expresses the views of the authors only. These views do not necessarily reflect those of the Joint Economic Committee, its Chairman, its Vice Chairman, or its Members.

**Encouraging
Official
Dollarization in
Emerging
Markets**

April 1999

**Joint Economic Committee
Staff Report
Office of the Chairman,
Senator Connie Mack**

SUMMARY

In many countries that have suffered high inflation and currency devaluations, the U.S. dollar is in widespread circulation as an unofficial currency. People trust the dollar because its long-term record has been among the best in the world. However, few foreign governments have been willing to *officially* dollarize, that is, replace their domestic currencies with the dollar. One reason is that under current arrangements, if they do so they lose seigniorage--the revenue gained from issuing currency.

This study explores the implications of the United States offering to share seigniorage with countries that officially dollarize and meet certain other requirements. It describes what official dollarization is, how it works, an idea for sharing the seigniorage from the dollar with officially dollarized countries, and the effects of dollarization both on the United States and on dollarized countries.

The study concludes that official dollarization has important benefits for the United States and dollarizing countries alike. Dollarization nearly eliminates the risk of devaluation, making domestic and U.S. investment more secure. In most emerging market countries, official dollarization will also reduce interest rates significantly, boosting their economic growth. Higher growth in other countries ultimately means greater demand for American goods and higher growth in the United States as well. People in many emerging market countries have already voted with their wallets for the dollar. By sharing seigniorage with governments that officially dollarize, the United States will promote growth and financial stability both at home and abroad.

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In the long term, finding ways of bribing people to dollarize, or at least give back the extra currency that is earned when dollarization takes place, ought to be an international priority. For the world as a whole, the advantage of dollarization seems clear to me...

Larry Summers (1992)

1. A MISSING PIECE IN INTERNATIONAL FINANCIAL REFORM

The Asian currency crisis and its repercussions in Russia and Brazil over the last two years have created fresh interest in reforming the "international financial architecture" in the hope of making it less prone to trouble. Proposals for reform range from cautious changes in bank supervision to sweeping recommendations for establishing a global central bank. A recent scorecard counts no fewer than 16 proposals (Eichengreen 1999, pp. 124-32).

The proposals have three major drawbacks. First, all require international agreement, which is worthwhile but may take a long time to achieve and implement. Improving bank supervision internationally, for example, requires regulators from various countries to resolve some knotty technical issues about national differences in accounting and legal standards. After regulators reach agreement, fully implementing new standards of supervision can take several years. Reforms that are still more controversial, such as managing the international monetary system through exchange-rate target zones or a global central bank, face political obstacles that seem insurmountable at present, quite apart from their flaws in design.

Second, few of the proposals are well specified, so it is hard to judge whether they are workable. The complex proposals need to have their complexities visible before implementation, so that weak spots can be detected and fixed. To mention one proposal, making an international bankruptcy court effective will involve developing an extensive code of law to apply to bankruptcy cases--something that has taken decades at the national level.

Third, most proposals neglect that the Asian crisis has been foremost a *currency* crisis; the banking, stock market, and budget crises that some countries have suffered have resulted from the currency crisis rather than causing it. Proposals that omit currency reform will not solve the problem. As Table 1 shows, good currencies are rare; the U.S. dollar is one of only a handful in the world.

The countries that have suffered most from the Asian crisis have been developing countries with central banks maintaining pegged exchange rates to the U.S. dollar. Under a pegged exchange rate, a

Table 1. Performance of the Dollar Versus Other Currencies, 1971 to 1998

Countries that avoided any years of 20+ percent inflation: Australia, Austria, Bahamas, Belgium, Belize, Bhutan, Botswana, Canada, Cyprus, Denmark, some members of Eastern Caribbean dollar zone (Antigua and Barbuda, St. Kitts and Nevis, St. Vincent and Grenadines), Finland, France, **Germany**, Hong Kong, Japan, Jordan, **Kuwait**, Luxembourg, Malaysia, Malta, Mauritania, Mauritius, Morocco, Nepal, **Netherlands**, Netherlands Antilles, New Zealand, Norway, **Panama**, Solomon Islands, South Africa, Sri Lanka, Sweden, **Switzerland**, Thailand, Tunisia, United Kingdom, **United States**.

Countries whose currencies lost no more than 25 percent of their value against the dollar or did better: Austria, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bosnia, Brunei, Cayman Islands, Denmark, Estonia, France, **Germany**, Hong Kong, Japan, **Kuwait**, Latvia, Libya, Luxembourg, Macau, Malaysia, **Netherlands**, Netherlands Antilles, Norway, Oman, **Panama**, Qatar, Saudi Arabia, Singapore, Slovakia, **Switzerland**, Taiwan, United Arab Emirates, **United States**.

Countries that had no restrictions on buying foreign currency at any time during the period: Bahrain, **Germany**, **Kuwait**, **Netherlands**, Oman, **Panama**, Qatar, Saudi Arabia, **Switzerland**, United Arab Emirates, **United States**.

Sources: IMF, *Exchange Arrangements and Exchange Restrictions*, various issues (series title varies) and *International Financial Statistics*, various issues.

Notes: Bold indicates countries whose currencies satisfy all these criteria, as the U.S. dollar does.

The data start at the beginning of 1971 because that was the first year in which the current system of generalized floating among the major currencies started to emerge. For currencies that did not exist throughout the period, the comparison starts with the first year they existed. The data are for members of the International Monetary Fund, which include almost all independent countries but few dependent territories. Information for some countries is incomplete.

country promises to maintain a determinate value for its currency in terms of a foreign currency, but retains features of monetary policy that give it the freedom to devalue at any time and make eventual devaluation likely. Pegging and target zones, a related arrangement, are one of three basic options in exchange rate policy. Another is a floating exchange rate, like the United States, under which a country does not maintain the value of its currency constant in terms of any foreign currency. But though the United States has had relatively low average inflation under a floating exchange rate, most developing countries that have tried floating rates have not. Those that have pegged their exchange rates have done so mainly as a way of restraining the inflation they fear would happen under floating rates. Ruling out pegging and floating leaves the third and best option for developing countries: a truly fixed exchange rate, which unlike a pegged rate has features that prevent devaluation.

What is needed, then, is a policy that can be implemented without time-consuming multilateral agreement, is well specified, and can prevent future currency crises by offering developing countries a way of achieving a truly fixed exchange rate. An option that combines all of these characteristics is *official dollarization*, under which countries that wish to do so replace their domestic currencies with the U.S. dollar. Under official dollarization, the Argentine peso, for example, will cease to exist, except perhaps as coins. All peso notes (paper money) and perhaps coins will be converted into dollar notes; all peso assets, liabilities, and prices will become dollar assets, liabilities, and prices. Since the current exchange rate is 1 peso = 1 dollar, a bank deposit of 1000 pesos will become a bank deposit of 1000 dollars.

Many countries today are already unofficially dollarized. Throughout Latin America and in most of the former Soviet Union, people have significant dollar bank deposits domestically or abroad, hold dollar notes, and quote prices for high-value items in dollars. In some countries, using the dollar is perfectly legal, in others illegal, but whatever the case, the dollar is a highly prized currency. In many countries, officially dollarizing would simply complete the extensive unofficial dollarization that already exists.

A disadvantage for countries thinking about official dollarization (all of which so far are emerging market economies) is that under current arrangements, if they dollarize they lose to the United States all their seigniorage—the revenue they gain from issuing currency. Seigniorage is the difference between the cost of putting currency into circulation and the value of the goods the currency will buy. For example, a \$1 bill costs about 3 cents to print, but the government can use it to buy \$1 worth of goods. The seigniorage is 97 cents. For the U.S. government, seigniorage from issuing dollars is roughly \$25

billion a year, which is a large amount in dollar terms, but less than 1.5 percent of total government revenue and only about 0.3 percent of gross domestic product (GDP).

This study explores the possibility that the United States offer to share seigniorage with officially dollarized countries, as a way of reducing or eliminating the loss of seigniorage that they would otherwise experience. Their participation will be voluntary: they can continue to issue their own currencies, dollarize and share in the seigniorage that the United States earns if they meet certain criteria, or even dollarize unilaterally without sharing seigniorage. Under the arrangement described here, dollarization will probably cost American taxpayers little or nothing initially, will probably generate increased seigniorage for the United States in later years, and will have benefits for trade and for financial markets.

Whether countries share seigniorage with the United States or not, dollarization is complementary to proposals that the U.S. government has made, both alone and as part of international groups such as the Group of 22 nations (G-22 1998). It apparently is also complementary to all other proposals for reforming the international financial architecture. It does not make any other proposed reforms more technically difficult; in fact, it would make many easier. Dollarization is in that sense a key missing piece in reforming the international financial architecture.

2. BASICS OF DOLLARIZATION

What dollarization is. Dollarization happens when the U.S. dollar to some extent displaces domestic currency as the preferred currency for holding savings, making payments, and pricing goods. Often "dollarization" is used in a generic sense to refer to any foreign currency, not just the dollar, that displaces domestic currency.

Dollarization can be official or unofficial. Under unofficial dollarization, typically the domestic currency dominates small transactions but the dollar is important in large transactions and as a vehicle for savings. Where people do not trust the domestic banking system, they may also have large bank deposits abroad in dollars and may hold dollar notes as "mattress money." These are forms of savings that do not appear in official statistics of unofficially dollarized countries because the savings are outside the domestic financial system and in some cases violate national laws against holding foreign currency.

Less widespread is official dollarization, in which a country has no domestically issued notes and perhaps coins, instead using the dollar as official domestic currency. Many countries have used foreign

currencies at some point in their history: in the United States, foreign coins were legal tender until 1857. (At the time, Americans predominantly used coins rather than notes in retail trade.)

Because this study is specifically about officially replacing the domestic currency with the U.S. dollar rather than any other currency, "dollarization" will not refer to unofficial dollarization or to currencies other than the dollar unless specifically mentioned.

Where dollarization exists. Unofficial use of foreign currency is widespread. A study from the International Monetary Fund reports that in 1995, foreign-currency deposits exceeded 30 percent of "broad money" in 18 countries. (Broad money--M2, M3, M4--is currency plus bank deposits, plus certificates of deposits and other bank liabilities in some cases.) In another 34 countries, foreign-currency deposits were lower but still judged significant, averaging 16 percent of broad money (Baliño and others 1999, pp. 2-3). In most of the cases of the IMF study, the dollar is the main foreign currency that people hold. A study by the Federal Reserve System estimates that foreigners hold 55 to 70 percent of dollar notes in circulation, mainly as \$100 bills (Porter and Judson 1996, p. 899), though other researchers have estimated higher and lower figures (Feige 1997; Rogoff 1996, p. 268). Since dollar notes in circulation are currently about \$480 billion, if the Federal Reserve's estimate is correct, foreigners hold roughly \$300 billion. The highest concentrations occur in Latin America and the former Soviet Union. In Bolivia, for instance, people are paid in bolivianos and use them for buying groceries and other small transactions, but about 80 percent of bank deposits and many bank loans are in dollars, and expensive goods such as automobiles may be priced in and paid for in dollars. Russians are estimated to hold as much as \$40 billion in dollar notes, which is more than the value of all ruble notes and deposits (Melloan 1998).

The best-known *officially* dollarized country today is Panama, which has been dollarized since 1904. Appendix A describes its experience. Panama issues its own coins and has its own unit of account, the balboa, but since one balboa equals one U.S. dollar and coins are a small, subsidiary part of the money supply, that does not interfere with dollarization. Besides Panama, 11 other economies officially use the U.S. dollar; Table 2 lists them. Five are U.S. possessions. Another 20 or so small economies officially use foreign currencies other than the U.S. dollar, such as the Australian dollar and French franc. Several others issue domestic notes and coins but also grant the U.S. dollar or another foreign currency status as a parallel legal tender. Among them is Liberia, which formerly used U.S. dollar notes exclusively, but now also uses the notes of two rival governments

Table 2. Officially Dollarized (US\$) Economies, Start of 1999

Economy	Population	GDP (\$bn)	Political status / other remarks	Since
<i>Guam</i>	160,000	3.0	<i>U.S. territory</i>	1898
Marshall Islands	61,000	0.1	independent	1944
Micronesia	120,000	0.2	independent	1944
<i>Northern Mariana Is.</i>	52,000	0.5	<i>U.S. commonwealth</i>	1944
Palau	17,000	0.2	independent	1944
Panama	2.7 mn	8.7	independent; issues own coins	1904
Pitcairn Island	42	0.0	British dependency; also uses N.Z. dollars	1800s
<i>Puerto Rico</i>	3.8 mn	33.0	<i>U.S. commonwealth</i>	1899
<i>Samoa, American</i>	60,000	0.2	<i>U.S. territory</i>	1899
Turks and Caicos Is.	14,000	0.1	British colony	1973
Virgin Is., British	18,000	0.1	British dependency	1973
<i>Virgin Is., U.S.</i>	97,000	1.2	<i>U.S. territory</i>	1934
Total	~7 mn.	~47		
<i>USA</i>	268 mn,	8,100	<i>independent</i>	1700s

Sources: *Statesman's Year-Book* 1998-99; CIA 1998; IMF 1998, 1999. Population and GDP (gross domestic product) are for 1997 or latest prior year available.

Notes: *Italics* indicate U.S. possessions, which already indirectly receive a share of the seigniorage from being officially dollarized.

About 20 other economies use foreign currencies other than the U.S. dollar, such as the Australian dollar and French franc, as the official currency. Several others issue domestic notes and coins but grant the U.S. dollar or another foreign currency status as a parallel legal tender.

Except for Panama, estimates of GDP are in terms of purchasing power parity, which typically gives higher figures than the alternative method of exchange rate parity.

issued during the civil war of 1989 to 1996. Liberian dollars circulate alongside the U.S. dollar at depreciated exchange rates (Bogetic and Schuler 1999).

Official use of the dollar or other foreign currencies is rare today except in small economies mainly because of the perceived economic advantages of an independent monetary policy. An independent monetary policy implies that a country has a distinct domestic currency, typically issued by a domestic central bank. According to some economic theories, an independent monetary policy enables a country to manage the money supply, interest rates, and exchange rates so as to make economic growth higher or at least less variable than it would otherwise be. In practice, though, developing countries with central banks have had worse currencies and lower economic growth than those without central banks (Ghosh and others 1998; Hanke 1999; Hausmann and others 1999; Schuler 1996). Despite the poor record of central banking in developing countries, it persists because many people still believe that it should work well in theory and because it has the political advantage of allowing a government to print money when it cannot or does not wish to cover its budget deficits by other means (generating a type of seigniorage). Finally, many governments see a domestically issued currency as a symbol of national identity and political pride, even if their citizens would prefer to use dollars exclusively.

How dollarization works. In an officially dollarized economy the money supply works similarly to the way it works within the United States. Panama, for example, has much the same relation to the continental United States as Puerto Rico or Pennsylvania. If people want to accumulate dollars, they spend less; if they want to get rid of dollars, they spend more. Prices and the money supply are determined by a combination of local preferences and arbitrage with the rest of the world. As within the United States, interest rates and price indexes tend to move up and down in relatively small steps, not in sudden leaps. Inflation rates can differ between Panama and the United States just as they can between Philadelphia and Los Angeles, but the use of a common currency, especially if reinforced by free trade, tends to keep prices of internationally traded goods close to the levels they have in the United States, putting a ceiling on inflation. Interest rates tend to be close to U.S. levels, plus a premium for country risk (political unrest or other factors operating at a national level that reduce the prospect a loan will be repaid). Because a dollarized system has no domestically issued currency, except perhaps coins, there is no need for exchange controls to support the currency and crises in the balance of payments do not happen (Ingram 1962).

The main difference between a dollarized country such as Panama and the United States is that Panamanian domestic banks lack access to the Federal Reserve System as a lender of last resort. The Federal Reserve acts as a lender of last resort only to U.S. banks, not to banks from other countries. However, Panamanian banks can borrow in local money markets that are closely linked to world markets through the presence of U.S. and other foreign banks. The head offices of those banks can act as sources of emergency funds for their own branches and for other banks in Panama. It is also possible for a dollarized country to establish an international line of credit, such as Argentina has established for its currency board-like system (BCRA 1998). So, a dollarized system has or can devise substitutes for a central bank as a lender of last resort.

Seigniorage. Under current arrangements, countries that dollarize lose to the United States all their seigniorage. Earlier, seigniorage was defined as the difference between the cost of putting currency into circulation and the value of the goods the currency will buy--in the case of a \$1 bill, about 97 cents. (Like a \$1 bill, a \$100 bill costs about 3 cents to print, so the seigniorage for it is an even larger part of its total value.) More generally, the concept of seigniorage applies not just to currency, but to the entire monetary base, which comprises currency in circulation (notes and coins outside banks) plus bank reserves (note and coins held in bank vaults, and deposits of banks at the at the central bank or such other monetary authority as the country has).

An equivalent but more complicated way to think of seigniorage is to observe that currency pays no interest. Somebody who holds \$100 in notes and coins could instead buy a Treasury bond and earn interest on it. By holding notes and coins rather than the Treasury bond, it is as if he is giving the U.S. government an interest-free loan. Under this way of thinking, seigniorage is the monetary base times some measure of the interest rate.

It is important to distinguish between gross and net seigniorage. Gross seigniorage is the amount earned from issuing currency before taking expenses into account. Net seigniorage is what is left after paying for printing notes, minting coins, and employing the staff of the Federal Reserve System. Net seigniorage is the part of seigniorage available for the rest of the government to spend. In recent years, the cost of printing notes and minting coins has been around \$400 million a year. The cost of operating the Federal Reserve System has been roughly \$2 billion, of which half has been offset by fees that banks pay, such as charges for using the Federal Reserve's check clearing system.

The net earnings of the Federal Reserve include both interest on its holdings of Treasury securities, which are like seigniorage, and

Table 3. Statistics Relevant to Seigniorage from the Dollar, 1990 to 1999

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1990	325.6	246.8	7.51	1.5	0.6	24.3	1253.2
1991	337.2	267.3	5.42	1.6	0.7	19.2	1324.4
1992	366.8	292.9	3.45	1.7	0.7	22.9	1381.7
1993	400.2	322.2	3.02	1.8	0.9	14.9	1409.4
1994	434.6	345.3	4.29	2.0	1.0	18.0	1461.7
1995	453.8	372.4	5.51	2.0	1.0	23.4	1515.7
1996	475.2	394.9	5.02	2.1	1.1	20.5	1560.5
1997	513.2	425.5	5.07	2.2 e	1.1 e	19.6	1601.2
1998	528.6	460.1	4.81	2.2 e	1.1 e	24.5	1652.6
1999	--	--	--	--	--	25.4e	1727e

(1) Year

(2) Monetary base, end of year (\$bn)

(3) Average currency in circulation (\$bn)

(4) Average interest rate, 90-day Treasury bill (%)

(5) Federal Reserve gross expenses (\$bn)

(6) Federal Reserve net expenses (\$bn)

(7) Federal Reserve payments to Treasury (\$bn)

(8) Federal budget (\$bn)

Sources: IMF 1999, line 14 (monetary base--the IMF calls it "reserve money"); *Economic Report of the President* 1999, pp. 408, 412, 419 (currency in circulation, interest rate, Federal budget); Federal Reserve System, various issues (Federal Reserve gross and net expenses); *Historical Tables* 1999, pp. 40-1 (Federal Reserve payments to Treasury).

Notes: Monetary base for 1998 is November. Net expenses (column 5) are those not covered by fees collected for clearing checks and performing other services. Federal Reserve payments to the Treasury are mainly seigniorage, but also include the Federal Reserve System's gains or losses from trading Treasury securities and foreign currency.

earnings from trading activity to support its goals in monetary policy. The Federal Reserve buys and sells Treasury securities and foreign currencies. When its trading activity generates a profit, its payments to the Treasury are higher than the earnings from seigniorage alone would be; when trading generates a loss, the payments are lower. In 1998,

more than 90 percent of the money that the Federal Reserve paid to the Treasury came from interest on Federal Reserve holdings of Treasury securities. Table 3 shows payments to the Treasury and other statistics relevant to seigniorage. Recently the payments have been about \$25 billion a year. The great bulk of seigniorage derives from notes; seigniorage on coins was only about \$600 million in 1998 (United States 1999, p. 261).

3. SHARING SEIGNIORAGE FROM THE DOLLAR

People have occasionally suggested before that the United States share the seigniorage from dollarization, but nobody has described in detail how to do so. To show what factors need to be taken into account, this study offers quite specific ideas, though an implemented version may differ in some details.

The idea. The U.S. government will make a standing offer to all qualifying countries. There will be no time limit: qualifying countries can join, or quit, at any time. A later section describes the criteria for gaining certification from the U.S. government as a qualifying country. The purpose of the criteria is to be reasonably sure that dollar notes (paper money), rather than the notes of some other currency, will predominate in countries that eliminate their domestic currencies. The United States will accept countries that wish to accept the offer and meet the criteria for certification, but it will not pressure any country to use the dollar.

To qualify for a share of the seigniorage from dollarization, then, a country will have to retire from circulation the entire domestic-currency monetary base, except for coins if it intends to continue issuing them (like Panama). In most countries the value of coins in circulation is 5 percent or less of the value of notes in circulation, so the amount of seigniorage from coins is correspondingly small.

Economies that are already dollarized but are not U.S. possessions, and therefore do not indirectly receive a share of seigniorage through Federal spending, could qualify for a share by temporarily introducing their own currencies and then re-dollarizing. To avoid such charades, it seems fair to share seigniorage with already dollarized economies along the same lines as with newly dollarizing countries. As Table 2 shows, the combined population and economic size of already dollarized economies that are not U.S. possessions are quite small, so sharing seigniorage with them will be a correspondingly small expense.

To prevent any misunderstanding, the terms of the standing offer will state that countries accepting it acknowledge that the Federal

Reserve System will not act as a lender of last resort to them, nor will it be obliged to take any but purely domestic considerations into account in formulating monetary policy. That does not mean that the Federal Reserve will ignore conditions in other countries: after all, in its recent policy making it has considered the possible effect on the U.S. economy of currency crises in Asia, Russia, and Brazil--places that are not even dollarized. Furthermore, the Federal Reserve's occasional interventions in the foreign-exchange market show that it cares about the exchange rate of the dollar with other currencies, especially the euro and the yen. But countries that become dollarized need to understand from the start that the standing offer applies only to sharing seigniorage. The Federal Reserve will not be a multinational central bank like the European Central Bank.

To strengthen the Federal Reserve System from political pressure arising from more widespread official use of the dollar, Congress should revise statute law to give the Federal Reserve a clearer mandate. The Humphrey-Hawkins Act should be revised and price stability should be made the sole goal of the Federal Reserve System. A proposal to accomplish just that was Senator Connie Mack's Economic Growth and Price Stability Act of 1997 (105th Congress, Senate bill S. 611), which should be reintroduced. A similar bill in the House of Representatives was H.R. 2360 of 1997, sponsored by Representative Jim Saxton.

What should be the basis for calculating shares of seigniorage?

The most logical choice as the basis for calculating shares of seigniorage seems to be the dollar value of currency in circulation. Another possibility is the monetary base, which, to repeat, is currency in circulation plus bank reserves. Many countries require banks to hold a minimum ratio of reserves to deposits; in the United States the ratio is 10 percent. The part of the monetary base composed of bank reserves is mainly required reserves, which act as a type of tax on banks because they are typically higher than banks' economic need for reserves. Currency in circulation, on the other hand, exists because the public has a genuine demand for it, not because the public is required to hold a minimum ratio of notes and coins to total income. Counting the entire monetary base for calculating shares of seigniorage would in effect reward countries, such as Chile, that tax their banks more through reserve requirements. This study assumes for simplicity that only currency in circulation will count for calculating shares of seigniorage, but the question deserves further thought.

For the purpose of calculating the amount upon which the United States pays seigniorage, dollarizing countries will be allowed to count the domestic currency in circulation that the public actually exchanges

with them for dollars, up to a maximum of all domestic currency in circulation.

To become dollarized, a country need only convert domestic currency in circulation (or at most the domestic-currency monetary base, M0) into some form of the dollar monetary base; it need not convert broader measures of the money supply that include bank deposits, such as M1, M2, and M3; domestic-currency bank deposits will become dollar bank deposits, not dollar notes.

How much seigniorage should the United States share? It is feasible to divide the seigniorage from dollarization in any proportion: 75 percent for the dollarizing country, 25 percent for the United States, 50-50, etc. Dollarization will be more attractive the more seigniorage the United States gives. This study assumes that the United States will give dollarizing countries all the net seigniorage from *increases* in the dollar monetary base attributable to their becoming dollarized. The United States will retain all the seigniorage it collects from the approximately \$540 billion of the dollar monetary base *already* in circulation, except for a small amount to “grandfather” already dollarized economies.

It bears repeating that sharing the seigniorage from dollarization with newly dollarized countries—even up to 100 percent of the seigniorage from converting domestic currency in circulation into dollars—will not reduce the current level of seigniorage that the United States receives.¹ A somewhat related point is that it is possible to imagine that giving any seigniorage at all to dollarizing countries will

¹ It is possible to imagine circumstances in which the demand for dollar notes falls in a dollarizing country. Suppose that Russia dollarizes. Russians hold dollar notes of as much as \$40 billion because they distrust both the ruble and Russian banks. Dollarization plus allowing foreign banks to establish branches anywhere in Russia makes bank deposits much more trustworthy, and Russians may respond by depositing much of their “mattress money” into banks, reducing their holdings of dollar notes by some billions. However, the same thing can happen without dollarization, for instance if Russia replaces its central bank with a currency board. Russians are evidently the largest holders of dollar notes after Americans, yet their estimated holdings are less than 8 percent of the total dollar monetary base. Since the dollar monetary base has been growing by \$25 billion or more a year in recent years, even a large fall in demand for dollar notes in Russia will appear as a temporary slowdown in the rate of growth of the dollar monetary base, not as an actual decline. Only if a similar phenomenon happens in many countries at once will there be a decline in the dollar monetary base and the seigniorage it generates. Even so, the decline will probably be brief. Holdings of dollar notes are very likely to increase as the economies of dollarized countries grow, just as holdings of notes around the world have increased as wealth has increased.

reduce seigniorage for the United States below what it could have been. Perhaps dollarizing countries would have become officially dollarized even without receiving any seigniorage. If that is correct, though, there should be more dollarized countries already. To obtain dollar notes, a country will have to give the Federal Reserve System dollar assets of equivalent value, such as U.S. Treasury securities. If the country continued to issue its own currency and held the Treasury securities as foreign reserves, the U.S. government would pay it interest on the securities. By sharing seigniorage if the country dollarizes, the U.S. government in effect pays interest on dollar notes that it otherwise would have paid on Treasury bills. This switch neither adds nor subtracts from the total interest payments that the U.S. government makes.

Besides sharing seigniorage from the initial amount of dollars, it also seems fair to share seigniorage from a general increase in the demand for dollars, according to procedures discussed later. So, if the dollar monetary base doubles and the interest rate paid remains the same, a dollarized country will receive approximately double the amount of seigniorage it received when it first qualified for the standing offer. This seems fair because presumably dollarized countries will contribute to the general increase in demand for the dollar monetary base, so they will deserve to share in the resulting increase in seigniorage. It is like them reinvesting interest on their holdings of Treasury securities to buy new Treasury securities. Sharing seigniorage from an increase in demand for dollars also seems fair because demand for dollars depends partly on inflation, which the United States controls. As long as inflation remains low, say in single digits per year, people tend to accumulate more dollar notes when the purchasing power of the dollar falls, so as to maintain a roughly constant amount of purchasing power. If the United States did not share the increase in seigniorage resulting from the reduced purchasing power of the dollar, it would in effect benefit from higher inflation at the expense of other countries, ultimately reducing towards zero the real value of the seigniorage they receive and the incentive for them to remain dollarized. Under the formula listed later, all qualifying officially dollarized countries will share proportionally with the United States when the dollar monetary base expands or shrinks.

Sharing seigniorage is important not so much in itself as for reducing an obstacle to dollarization. Dollarization has the potential to boost economic growth in many countries because it nearly eliminates the risk of devaluation and bring interest rates closer to the levels that exist in the United States. The gains that higher economic growth would generate are potentially much larger than the amounts involved in seigniorage.

Issues for a dollarizing country. A country that wants to become officially dollarized will need to consider a number of issues. Among them are:

- Whether to continue issuing coins, like Panama, or simply use U.S. coins, like Micronesia.
- Whether the existing foreign reserves of the central bank are adequate for dollarization.
- If reserves are inadequate, how to obtain additional reserves--by selling domestic assets of the central bank or government, borrowing, etc. As is discussed later, the actual foreign reserves of many countries considering dollarization exceed their official foreign reserves because people hold foreign assets not recorded in official statistics, and a credible monetary reform such as dollarization can bring some of these unrecorded reserves into official coffers.
- If the United States allows the monetary base beyond currency in circulation to be used for calculating shares of seigniorage, whether the government should convert that part of the monetary base into the dollar monetary base, convert some of it into bonds, or simply write it off.
- What exchange rate to use for exchanging domestic currency into dollars. (The more units of local currency per dollar, the lower dollar reserves need to be for immediate dollarization.)
- How fast dollarization should proceed. (Immediate dollarization, while technically feasible, may not always be viewed as politically most expedient.)
- How to handle the legal aspects of changing currencies; for example, whether to revise contracts for high rates of interest, which were made under the assumption that they would be repaid in a domestically issued currency with higher inflation than the dollar.
- How to reorganize the components of the central bank, since dollarization will transfer to the Federal Reserve System the function of making monetary policy.

Such issues can be complicated, but it is not necessary to discuss them here because they do not directly concern the United States and are to some extent treated elsewhere (Schuler 1999). Under the standing offer, each country that wishes to share seigniorage from dollarization will be free to take the route to dollarization that it thinks best so long as it ends up meeting the criteria that the U.S. government has established for sharing seigniorage. The U.S. government will have no role except to assure itself that after the conversion is complete,

domestic-currency notes (and coins, if the dollarizing country chooses) are no longer circulating.

How a dollarizing country will obtain dollars. To obtain dollar notes and coins from the Federal Reserve System, a dollarizing country will give to the Federal Reserve highly liquid dollar assets of equivalent value from a short list specified by the U.S. government—deposits at the Federal Reserve, U.S. Treasury securities, or funds at U.S. banks. (The gold that many countries keep on deposit at the Federal Reserve Bank of New York could also be part of the list, although this is a question that requires further thought.) The dollar assets can be given to the Federal Reserve directly or through the intermediary of a bank that specializes in handling dollar notes. The Federal Reserve will only give dollars in exchange for specified dollar assets; it will not simply give dollars away. So, dollarization according to this arrangement requires that a country have 100 percent backing in dollar assets for whatever it dollarizes. Dollarization does not require that a government already have all the necessary assets in dollars before it can even consider starting to dollarize. The government and the central bank can have assets in other currencies, provided they can readily trade them for dollar notes or for assets acceptable to the Federal Reserve. In some countries, domestic-currency assets may have a sufficiently liquid market that the central bank can obtain a substantial amount of dollars by selling them. Again, the U.S. government will have no role in deciding what route a country takes to dollarization; all it will do is certify that a country qualifies for sharing seigniorage.

The dollarizing country will agree with the United States on a date for becoming officially dollarized, which will become the date on which the United States begins crediting to that country a share of seigniorage. By that day, at least 75 percent of domestic currency in circulation must have been exchanged for dollars. From that day on, no new domestic-currency notes and (if applicable) coins will be manufactured or placed into circulation, and the plates and dies used to make them will be destroyed. A threshold of 75 percent seems advisable because it is unrealistic to expect that people will redeem 100 percent of the domestic currency in circulation for dollars. Some notes will be kept by collectors, or will have been lost or destroyed. Substantial rather than total replacement of the monetary base should be the standard for determining that a country is dollarized.

Especially in large dollarizing countries, governments will probably find it desirable to allow people to continue to exchange domestic currency in circulation for dollars for some time after the date of official dollarization. The grace period will give people who live in remote areas time to exchange their domestic currency for dollars. To

reflect this, the United States could allow dollarizing countries to make a final addition to the initial dollar amounts of their shares of seigniorage one year after the date of official dollarization.

Implementing dollarization in the dollarizing country. Besides the monetary base, other assets, liabilities, and prices will also be expressed in terms of dollars. For bookkeeping purposes, assets, liabilities, and prices will be converted on the books from domestic currency into dollars at the exchange rate that the government has set. In dollar terms, they will presumably have the same value that they had before. The only difference will be that now they will be expressed in dollars, which are a more stable unit of account.

By the day a country becomes officially dollarized, laws making the domestic currency a legal tender will cease to apply, although the government of the country may continue for some time afterwards to accept domestic currency in circulation and pay out dollars in exchange. The dollar should be made a legal tender but, in keeping with the voluntary nature of the standing offer, the United States should not pressure any dollarizing country to make it a forced tender. A legal tender is a currency that may legally be used in transactions between consenting parties, whereas a forced tender is a currency that people are legally required to accept even if they do not want it. It is possible for multiple currencies to be legal tender at the same time, though the notes of one currency will tend to dominate in circulation.

The rate of return for paying seigniorage. What rate of return (interest rate) should be used to calculate seigniorage? As has been mentioned, one way to think of the dollar monetary base is as being like Treasury securities, but paying zero interest. This suggests using the interest rate on some kind of Treasury security to calculate the gross seigniorage of dollarization. The Federal Reserve System pays out seigniorage to the Treasury weekly. If many countries become dollarized, weekly payments to them could be administratively complicated. Quarterly payments seem reasonable. If seigniorage is paid quarterly, a logical choice is to instruct the Federal Reserve System to calculate the rate of return on the monetary base using the average rate of the 90-day Treasury bill. The Federal Reserve will pay interest on the part of currency in circulation that the dollarizing country has exchanged for dollars, sharing seigniorage according to a formula in the next section.

The economist Robert Barro (1999) has suggested an alternative way of calculating and sharing seigniorage, which does not involve using an interest rate. He uses Argentina as an example since it is now debating dollarization. Under his plan, if Argentina had peso notes equivalent to \$16 billion, it would give them to the Federal Reserve System in exchange for \$16 billion in dollar notes. Unlike this study,

Barro would not require Argentina to give the Federal Reserve any *dollar* assets and he would make a lump-sum payment up front instead of making a series of smaller quarterly payments for as long as Argentina remains dollarized.

The problem with Barro's idea is that Argentina could take the lump-sum payment, then turn around and reintroduce its domestic currency, cheating the U.S. government out of \$16 billion. The United States would have \$16 billion in peso notes that it could spend, but Argentina could simply print new notes of a different design and declare the old ones invalid. Similar problems apply if instead of peso notes the Federal Reserve holds Argentine government bonds. Argentina seems trustworthy, but not all countries may be.

4. FORMULAS FOR SHARING SEIGNIORAGE

Having analyzed the principles of sharing seigniorage, let us proceed to formulas that can be used to calculate how to share seigniorage.

Net seigniorage. Recall that gross seigniorage is the revenue earned from issuing currency before taking expenses into account, while net seigniorage is what is left after paying for printing notes, minting coins, and employing the staff of the Federal Reserve System. It is the net seigniorage that can be shared with other countries. A simple and logical formula to calculate the share of net seigniorage that a dollarized country will receive from the United States is:

$$\begin{aligned} & \text{Dollarized country's dollar share of net seigniorage} \\ &= \left(\begin{aligned} & \text{[total average dollar monetary base over the period} \\ & \times \text{average interest rate on 90-day Treasury bills during period]} \\ & - \text{net cost of operating the Federal Reserve} \end{aligned} \right) \\ & \times \text{dollarized country's share of total dollar monetary base} \\ & \times \text{proportion of seigniorage revenue that the United States pays} \end{aligned}$$

If the United States pays 100 percent of the net seigniorage attributed to a dollarized country's use of the dollar, the last term of the formula is 1 (the decimal equivalent of 100 percent) and the term drops out of the formula. If the United States pays 75 percent rather than 100 percent, the last term is instead 0.75.

The share of a dollarized country in the total dollar monetary base will be determined when it becomes dollarized. (If only currency in circulation counts as the basis for calculating shares in seigniorage, one could use total dollar currency in circulation instead of the total dollar monetary base. That would change the percentages for each country but not the dollar amounts of the shares of seigniorage.) Using

Argentina as an example again, suppose it becomes officially dollarized on January 1, 2000, and that all the calculations are made on the basis of the calendar year. Suppose further that the dollar monetary base on December 31, 1999 is \$550 billion. To dollarize, the Argentine government gives to the Federal Reserve System Treasury securities totalling \$16 billion, the amount of Argentine peso currency in circulation (notes and coins outside banks) that the public has exchanged. In return, the Argentine government receives \$16 billion of dollar notes. Argentina's dollarization raises the total monetary base to \$566 billion, so

$$\begin{aligned}
 & \text{Argentina's share of total average dollar monetary base} \\
 &= \$16 \text{ billion} \div \$566 \text{ billion} \\
 &= 0.028, \text{ or } 2.8 \text{ percent}
 \end{aligned}$$

(These numbers, though only examples, are fairly close to the actual numbers. The numbers in the examples will sometimes be rounded off.)

For many years the dollar monetary base has grown by 5-10 percent a year, partly from higher demand for dollars in the United States and partly from higher demand abroad. Argentina will share the increased seigniorage that comes from an increased circulation of dollars. Its share will be proportional to the share of the total dollar monetary base it had when it became dollarized. So, if no new countries become dollarized in 2000, Argentina will still be credited with 2.8 percent of the total (in decimals, 0.028). Suppose that the average interest rate on 90-day Treasury bills is 5 percent a year (in decimals, 0.05), which is above the current level of about 4.25 percent a year but is in line with the average level for 1996 to 1998. Suppose further that the net cost of operating the Federal Reserve remains \$1 billion, and that the average monetary base during 2000 is \$580 billion. Plugging these numbers into the formula for net seigniorage yields:

$$\begin{aligned}
 & \text{Argentina's dollar share of net seigniorage} \\
 &= ([\$580 \text{ billion} \times 0.05] - \$1 \text{ billion}) \times 0.028 \times 1 \\
 &= (\$29 \text{ billion} - \$1 \text{ billion}) \times 0.028 \times 1 \\
 &= \$784 \text{ million}
 \end{aligned}$$

Adding new dollarizing countries. The figure of \$580 billion is assumed to be the *average* for the entire year 2000. Suppose that the amount of the dollar monetary base on *December 31, 2000* is \$600 billion. Argentina will be credited with 2.8 percent (\$16.8 billion). Now suppose that on January 1, 2001, Brazil dollarizes, and that its action adds \$50 billion to the monetary base, raising the monetary base

immediately to \$650 billion. The shares of the total monetary base will be recalculated to acknowledge Brazil's presence. Instead of being assigned a share of 2.8 percent ($\$16.8 \text{ billion} \div \600 billion), Argentina will now be assigned a share of about 2.58 percent ($\$16.8 \text{ billion} \div \650 billion). Argentina's percentage share of the total dollar monetary base will change, but the dollar amount of its share will remain \$16.8 billion. The addition of Brazil will not change the dollar amount of Argentina's share, nor will it change the amount of seigniorage that Argentina receives, if the cost per dollar of issuing dollars is constant. If, as is likely, there are some economies of scale in issuing dollars, so that the costs of issue do not rise quite as fast as the increase in the total dollar monetary base, then Brazil's decision to dollarize will generate a slight savings in costs. Argentina, Brazil, and the United States will share the savings in the form of slightly higher net seigniorage.

If Brazil reintroduces a domestic currency or otherwise becomes ineligible for seigniorage, the division of seigniorage will be recalculated to give the United States, Argentina, and other remaining dollarized countries a proportionally bigger share. So, if adding Brazil as a dollarized country caused Argentina's share of net seigniorage to fall from 2.8 percent to 2.58 percent, dropping Brazil will raise Argentina's share back to 2.8 percent, assuming that no new countries have dollarized in the meantime. Note that if a country reintroduces a domestic currency, the total dollar monetary base does not necessarily fall. The people of the country may well hold onto dollar notes as "mattress money" if they do not trust the reintroduced domestic currency. Short of searching everyone's house, the government may not be able to acquire the dollars it dispersed to the public when it dollarized.

Already dollarized economies. What about economies that are already dollarized? Seven--the Marshall Islands, Micronesia, Palau, Panama, Pitcairn Island (a negligible case), the Turks and Caicos Islands, and the British Virgin Islands--are not U.S. possessions and so receive no seigniorage directly or indirectly. Their combined population is fewer than 3 million and their combined gross domestic product in 1997 was only about \$10 billion. Unlike newly dollarizing countries, they have in effect already given up dollar assets in exchange for currency in circulation. We cannot know precisely how large the circulation is, so it is necessary to estimate. Perhaps the simplest way to do so is to assume that already dollarized countries are average in terms of their ratio of currency in circulation to gross domestic product. This would put them in the range of 4 to 6 percent of GDP; let us use a figure of 5 percent (in decimals, 0.05). The formula

for calculating the dollar amount of estimated currency in circulation for an already dollarized economy is then:

$$\begin{aligned} & \textit{Estimated currency in circulation (already dollarized economy)} \\ & = \textit{GDP} \times \textit{world average currency in circulation (\% of GDP)} \end{aligned}$$

For 1999, the total GDP of already dollarized economies that are not U.S. possessions should be roughly \$11 billion. Total estimated currency in circulation for those economies is:

$$\begin{aligned} & \textit{Estimated currency in circulation (already dollarized economies)} \\ & = \$11 \textit{ billion} \times 0.05 \\ & = \$550 \textit{ million} \end{aligned}$$

Suppose again that the average interest rate on 90-day Treasury bills is again 5 percent a year (in decimals, 0.05), and that the United States pays 100 percent of the net seigniorage attributable to a dollarized country's use of the dollar. The seigniorage that the United States will share with the already dollarized countries that are not U.S. possessions will then be

$$\begin{aligned} & \textit{Dollar share of seigniorage (already dollarized economies)} \\ & = \$550 \textit{ million} \times 0.05 \times 1 \\ & = \$27.5 \textit{ million} \end{aligned}$$

Panama will receive almost 90 percent of that amount because its economy is such a large proportion of the total. The whole amount, though, is minuscule compared to the roughly \$25 billion of total seigniorage from dollarization, and "grandfathering" already dollarized economies into the arrangement to share seigniorage will merely reduce slightly the *increase* of \$900 million in expected Federal Reserve payments to the Treasury this year.

Why these formulas? The formulas are quite simple. That is their appeal: because they involve easily verifiable numbers, countries that are considering dollarization will know what to expect if they dollarize, and there will be less scope for arguments about how to share seigniorage. To divide the seigniorage in exact proportion to each dollarized country's use of dollars, the ideal situation would be to know how many dollar notes and coins are circulating there. Without a distinct issue of dollars for each country, one that stays within national boundaries, it is impossible to know the precise amount. In some countries demand for dollar notes and coins will grow faster than average, in others slower than average. Because every country will receive an increase in seigniorage equal to the average increase

(excluding the one-time effects of new countries becoming dollarized), some countries may receive somewhat more seigniorage and others less than they would if it were possible to determine with a high degree of accuracy how many dollar notes and coins are circulating in each country. However, giving every qualifying country a proportional share of the increase in seigniorage has a rough-and-ready fairness to it because a high degree of accuracy is out of reach.

Other formulas for sharing seigniorage are conceivable, but involve difficulties because they are harder to verify and contain more room for controversy. Estimates of currency usage from household surveys have been questioned in the United States, because they give much lower figures than the total of currency actually in circulation. That is the case even though in the United States the underground economy is estimated to be smaller and notes are therefore presumably less widely used for illegal payments than they are in many other countries. Formulas based on estimates of GDP are likewise problematic because calculating GDP involves many statistical assumptions. Such formulas are appropriate only for countries that have already been dollarized for many years, where one cannot use the simple method of basing calculations on the dollars exchanged for domestic currency in circulation during dollarization.

5. CRITERIA FOR QUALIFYING TO SHARE SEIGNIORAGE

Countries wishing to qualify for sharing seigniorage from dollarization will require certification by the U.S. government. The criteria for certification will be simple and uniform.

The purpose of certification will be to ensure that a country has retired its domestic currency from circulation and that dollars are sufficiently widely used that the country is contributing significantly to total seigniorage. If people in the country mainly use the notes and coins of some other currency, such as the German mark, the country would be receiving seigniorage to which it is not contributing.

To be certified, a country will need to satisfy economic, legal, and political criteria. Meeting the criteria will not give a country a right to seigniorage from dollarization: seigniorage will be a gift of the U.S. government, not an entitlement. But it will be a gift that is dispensed according to clear rules established by law, not an arbitrary amount that varies according to whims.

Economic criteria. There must be a high probability that people in a dollarizing country will use at least the amount of dollars that comprise a country's initial share of the total dollar monetary base.

Later, the country must continue to belong to the dollar zone rather than to the zone of another currency.

Some indications that a country is likely to belong to the dollar zone if dollarized are that it currently considers the exchange rate with the dollar the most important exchange rate; it buys and sells mainly dollars when it intervenes officially in the foreign-exchange market; most exports are priced in dollars; if foreign-currency deposits are allowed, the dollar is the main foreign currency held; and dollar notes already circulate more widely in an unofficial or semi-official manner than the notes of any other foreign currency.

To illustrate, compare Argentina and Bulgaria. Argentina meets all the tests just mentioned. Bulgaria does not: the exchange rate of the Bulgarian lev is fixed to the German mark rather than the dollar; the Bulgarian National Bank buys and sells marks rather than dollars in the foreign-exchange market; most exports are priced in marks or in euros, the new Western European currency of which the mark is now a subdivision; and Bulgarians seem to hold more mark notes than dollar notes. Bulgaria is part of the mark/euro zone rather than the dollar zone. If Bulgaria were to dollarize, the mark would probably drive the dollar out of circulation quickly. Sharing seigniorage would give Bulgaria revenue to which it had contributed little because Bulgarians were not using the dollar.

Argentina or other qualifying countries must have retired at least 75 percent but no more than 100 percent of domestic currency in circulation and exchanged it for dollars. (In exceptional cases where there is reason to believe that much domestic currency in circulation has been destroyed, the U.S. government can reduce the lower limit below 75 percent.) In exchange for the dollars that have replaced domestic currency in circulation, the government of the dollarizing country must have given to the Federal Reserve an equal amount of specified dollar assets, such as U.S. Treasury securities. The plates used to print domestic notes and, if applicable, the dies used to make domestic coins must be destroyed, along with the notes and coins themselves.

There should be a provision to prevent dollarizing countries that have large excess foreign reserves from engineering big last-minute increases in the dollar value of domestic currency in circulation just to gain an undeservedly share of seigniorage. One way to do this is not to count for seigniorage sharing a greater dollar value of domestic currency in circulation than the average value for the previous year plus a growth factor of no more than perhaps 10 percent. At its sole discretion, the U.S. government could allow exceptions in unusual circumstances: during a currency stabilization following a high inflation, for example, the dollar value of domestic currency in

circulation often increases at double digit rates as demand for it revives.

Dollarization will be most effective in making the financial system strong if it is combined with removing exchange controls (which restrict the ability to buy foreign currency) and opening the financial system so that foreign firms can compete on an equal basis with domestic firms. As desirable as a more open financial system is, though, it seems inadvisable to make it a condition for sharing seigniorage. From an economic standpoint it may be desirable to open the financial system to foreign participation before dollarizing, but for political reasons that may be impractical. Countries that have dollarization or currency boards, which in many ways work like dollarization, have found that if their financial systems were initially closed, necessity eventually forced them to allow foreign firms, so as to take full advantage of the international pool of investment funds.

Legal criteria. The domestic currency must cease to be legal tender, although the government may continue during a grace period afterwards to pay dollars for domestic currency in circulation at the exchange rate it has set. The dollar must have legal tender status, though again, the United States should not pressure any dollarizing country to make the dollar a forced tender. The euro and the yen can be legal tender along with the dollar, for instance, even though the dollar is the dominant currency in circulation.

Should a dollarized country experience a civil war or an invasion there will be rival parties claiming payment of the country's share of seigniorage. Procedures for handling such a possibility should be developed, as the U.S. government has developed them for the general question of diplomatic recognition of governments during civil war or invasion.

Political criteria. The U.S. government must be convinced that a dollarizing country is acting in good faith, and is not trying to abuse the sharing of seigniorage somehow. It seems desirable for the United States to avoid linking the sharing of seigniorage to unrelated political issues. Dollarization has benefits for the United States even if the Administration or the Congress disagree with the policies of a country that is considering dollarization. Only under carefully specified circumstances, war against the United States being the most obvious example, should a country that has been certified be decertified for failure to meet political criteria.

Maintaining certification. To continue to be certified to share seigniorage from dollarization, a country must continue to meet the criteria, as determined by a periodic review from the U.S. government. The purpose of the review is not to use recertification as a political weapon, but merely to determine whether a country continues to

deserve seigniorage because dollars continue to circulate there. As a way of discouraging the Administration from using the threat of decertification as a political weapon, decertified countries can be given the option of appealing decertification to the Congress. However, some actions will be automatic grounds for immediate decertification without appeal: reintroduction of a government-issued domestic currency, discrimination against the dollar in legal tender laws, or war against the United States. A country that is automatically decertified will forfeit any seigniorage accumulated since the previous quarter but not yet paid by the United States.

A country decertified on other than automatic grounds will have the option of negotiating a special bilateral arrangement with the United States to regain some seigniorage. Take Ukraine as a hypothetical example, since the dollar is widely used unofficially but Ukraine is close to Western Europe, which uses the euro. If Ukraine were to dollarize, but simultaneously grant the euro equal status with the dollar as legal tender, over time the euro might replace the dollar as the dominant currency in circulation as Ukraine's economy became highly integrated with the economies of Western Europe. The dollar monetary base being used in Ukraine might shrink to perhaps half of the amount credited to Ukraine, so the country would not really be generating anywhere near its proportional share of dollar seigniorage. In such circumstances, as long as a Ukraine or another dollarized country continues to use what the U.S. government estimates to be a significant amount of the dollar monetary base, the U.S. government can offer to share seigniorage based on some individually negotiated formula less generous than the standard offer. Also, to give time for bilateral negotiations to devise a different formula, seigniorage can continue to be paid according to the standard formula for one year following decertification on other than automatic grounds. Offering to continue sharing seigniorage for up to one year after decertification will be a sign that the United States will not without warning cut foreign governments off from a source of revenue that may be important to them.

If a country is recertified within three years of decertification, the U.S. government could, with Congressional approval, award some of the "back seigniorage" that the country would have earned from being certified continuously. This provision will allow the United States to reward a government that reverses course, such as a country that carries out the first stages of reintroducing a domestic currency, then reverts to official dollarization. After three years a country will lose the chance to gain back seigniorage. Back seigniorage will be purely a gift, awarded solely at the discretion of the United States.

Table 4. Data on Some Candidates for Dollarization

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Argentina	36	324	41.1	16.4	13.5	21	1.0	6.81
Brazil	160	804	113	49.0	14.4	44	3.2	29.5
Ecuador	12	19.8	3.38	1.23	0.51	1.6	36	39.3
El Salv.	5.9	11.2	1.39	1.85	0.40	1.8	2.5	9.4
Indonesia	200	215	34.4	10.1	5.2	9.9	58	62.8
Mexico	96	403	69.0	19.5	11.7	22	16	26.9
Russia	147	443	78.6	13.0	9.1	-4.5	28	50.6
Venezuela	23	88.4	21.0	6.70	1.94	14	36	34.8
<i>Panama</i>	2.7	8.7	2.26	<i>n.a.</i>	<i>n.a.</i>	0.7	0.6	6.77
<i>USA</i>	268	8100	1653	529	464	78	1.5	5.35

- (1) Country
(2) Population
(3) GDP (\$bn)
(4) Budget (\$bn)
(5) Monetary base (\$bn)
(6) Currency in circulation (\$bn)
(7) Net foreign reserves (\$bn)
(8) Inflation rate (\$bn)
(9) Interest rate (\$bn)

Source: IMF 1999, lines ae and rf (exchange rates), 11 and 16c (foreign assets and liabilities of monetary authority), 14 (monetary base--the IMF calls it "reserve money"), 14a (currency in circulation), 60b (interest rate for most countries) or 60l (interest rate for Ecuador, Panama, and Venezuela), 64 (inflation--consumer price index), 82 (budget of national government), 99b (GDP), and 99z (population).

Notes: **Bold** indicates countries that have suffered currency crises within the last year. *Italics* indicate countries already using the dollar and included for comparison. Countries included are those where there has been some local discussion of dollarization.

n.a. = not available.

Population, GDP (gross domestic product), and budget are 1997; monetary base and foreign reserves are end-1998; inflation and interest rates are the average annual rates for 1998; monetary base, currency in circulation, and net foreign reserves are for the end of 1998. Where the data specified are unavailable, the table uses the most recent prior data.

Who would probably qualify. Under the criteria that have been described, most countries would qualify to share seigniorage if they decided to dollarize. The main exceptions are a number of countries in Europe and Africa that are part of the euro zone. Almost all European countries west of Ukraine either belong to the European Central Bank or give the euro more weight than the dollar in their exchange rate policy. Where foreign notes are heavily used, notably in the Balkans, the German mark rather than the dollar predominates. Africa's CFA franc, which more than a dozen countries use, is pegged to the French franc, and there are some other African countries such as Morocco whose circumstances make it likely that the euro rather than the dollar would predominate if there were no domestically issued currency. (The euro now exists as a financial unit, but euro notes and coins will not replace the German mark, French franc, and other currencies until 2002.) But in principle, dollarization could extend to every country in the Americas, Asia, and the Pacific, plus almost all the former Soviet Union and half or more of Africa.

How many of those countries would actually dollarize is a different question. Dollarization probably will have little appeal in countries that already have good currencies. Singapore, for example, has had low inflation and low interest rates for many years. It is unlikely to dollarize unless most of the countries around it do so. But most emerging market countries have currencies that performed much worse than the Singapore dollar, so for them dollarization is correspondingly more attractive.

Table 4 shows data on some countries where government officials or the local press have recently shown interest in dollarization.

6. OPTIONS BEYOND THE STANDING OFFER

The standing offer will be open to all qualifying countries. If it seems prudent, the U.S. government can supplement the standing offer with options available to selected countries solely at U.S. discretion. The purpose of the options would be to help countries that might otherwise have difficulty becoming and remaining dollarized.

Assisting dollarization when reserves are less than 100 percent. The foreign reserves of many countries are greater than official statistics indicate, because people already hold considerable amounts of dollar notes and offshore deposits that escape official detection. It has been the experience of a number of countries in recent years, including Argentina and Estonia, that a credible monetary reform can bring dollar notes and offshore deposits into the domestic banking system. The foreign reserves of the banking system, including the reserves of the central bank or other monetary authority, increase.

Since dollarization is a highly credible reform, it may well have a similar effect in many countries.

Even so, there may be cases where a dollarizing country lacks the dollar assets to convert all domestic currency in circulation into dollars at the going exchange rate. In such cases, the United States could lend it the shortfall and keep part or all of the seigniorage in later years to repay the loan. For example, if a country has domestic currency in circulation equal to \$10 billion at the going exchange rate with the dollar, but only has \$5 billion of dollar assets, the United States could extend a loan for the remaining \$5 billion. Then the country would be able to convert all domestic currency in circulation into dollars. Instead of paying to the country the seigniorage from the \$10 billion, the Federal Reserve would keep part or all of it until the \$5 billion loan had been repaid with interest.

Such loans have potential problems, which is why they need careful scrutiny and should require Congressional approval. The United States needs to be confident that a borrowing country will remain dollarized long enough that the seigniorage it shares will repay the loan. To help ensure that the loan will be repaid, the United States should lend no more than 50 percent of the dollars that a dollarizing country exchanges for its currency in circulation. To reflect that some element of risk is involved, the loan should carry an interest rate higher than the rate used to calculate the payment of seigniorage. The rate should vary according to the likely period of the loan, and should be the rate for U.S. Treasury securities of the same maturity plus a premium that may vary from country to country. Countries that default, by ending dollarization before they have repaid the loan, will be liable for the same sanctions they would face for defaulting on other U.S. government loans.

If a country reintroduces a domestic currency before its loan is repaid, its government is unlikely to receive any direct benefit from the presence of dollars in circulation within the country. In dollarizing, it will have dispersed dollar notes and coins to the public, and it will have no easy way to retrieve them. Dollarization in effect disperses foreign reserves that under other monetary systems are centralized in a central bank or other monetary authority; recentralizing the reserves can be difficult. If people do not trust the new domestic currency, they may continue to hold dollar notes as "mattress money." If so, the United States will receive seigniorage from the dollars even though the government of the formerly dollarized country has broken its promise.

Allowing seigniorage to be pledged as collateral. Dollarizing countries whose initial dollar reserves are less than 100 percent of domestic currency in circulation will have another option for obtaining additional reserves that does not depend on the U.S. government.

Because the revenue from dollarization is a fairly steady source of income, it can be pledged as collateral, such as for lines of credit with foreign banks to support domestic banks during financial distress. The terms on which collateral is pledged are a matter for dollarized countries and their lenders. The U.S. government need not be involved except to the extent that it obeys instructions from the dollarized country to deposit seigniorage with one party rather than another. Again, the Federal Reserve System should accept no obligation to be a lender of last resort to dollarized countries, though under existing procedures the Treasury could lend to a country through the Exchange Stabilization Fund and demand that the seigniorage to be pledged as collateral. Congress could even require that countries with which the United States shares seigniorage be required to pledge the seigniorage as collateral if they borrow from the Exchange Stabilization Fund.

7. LEGISLATION AND ADMINISTRATION

Legislation. To make the standing offer durable and to specify options beyond it, should any seem advisable, the arrangements described here, or something like them, should be written into law. The law should be specific, leaving certain administrative details flexible but specifying clearly the intent and main points of the arrangement. The more predictable the rules of the offer are, the more of an encouragement there will be for countries considering dollarization.

Administration. Who should administer the arrangement that this study proposes? It seems most appropriate for the Federal Reserve System to administer certification, decertification, and payment of seigniorage, though for any international negotiations, such as whether to extend to a dollarizing country any assistance beyond the standing offer, the Treasury Department and perhaps the Department of State should be involved. The precise delineation of responsibilities is a matter for further reflection. The Federal Reserve is, by design, more independent from the Administration and the Congress than the Treasury Department. Assigning the Federal Reserve the responsibility of administering the standing offer will reinforce the impartial nature of the offer.

Paying shares of seigniorage. To pay a share of seigniorage to a dollarized country, the Federal Reserve System will credit its government each quarter with the amount calculated by using the formulas listed earlier. The government can then leave the funds on deposit at the Federal Reserve, though presumably they will not earn interest; transfer them to a commercial bank; or convert them into dollar notes and coins, as it prefers.

8. COSTS AND BENEFITS FOR THE UNITED STATES

The arrangement that this study has suggested has important benefits for the United States. It is a way for the United States to help itself and other countries at the same time.

Economic costs. As has been mentioned, “grandfathering” into the arrangement for sharing seigniorage the seven already dollarized economies that are not U.S. possessions will cost less than \$30 million a year under realistic assumptions about interest rates and the size of their economies. That will hardly be noticeable beside the increase of about \$900 million expected this year for the Federal Reserve System’s payments to the Treasury (which include seigniorage plus profits and losses from trading). Dollarization in countries that currently issue their own currencies is highly unlikely to reduce the current level of seigniorage that the United States receives, or even reduce the rate of growth of seigniorage. Recall that giving *newly* dollarized countries the share of seigniorage attributable to their using dollars does not reduce the amount of seigniorage that the United States currently earns. It is merely like switching the government liabilities that interest is paid on, from Treasury securities to the monetary base. Since there are economies of scale in issuing currency, the more countries are dollarized, the broader the base over which to spread the costs, increasing slightly the seigniorage that the United States and dollarized countries receive.

Encouraging dollarization in other countries is unlikely to be costly in the sense of making it harder for the Federal Reserve to conduct monetary policy. More than half of all dollar notes in circulation are probably held abroad already, with the greatest growth in foreign holdings apparently occurring in recent years (Judson and Porter 1996, p. 896). But it has been precisely in recent years that the Federal Reserve has successfully reduced inflation first to 3 percent and now to less than 2 percent a year.

Political risks. Does dollarization involve political risks for the United States? One such risk is the possibility that when the Federal Reserve System increases interest rates, dollarized countries will try to exert political pressure on the U.S. government, hoping that it in turn will pressure the Federal Reserve to keep interest rates inappropriately low. The pressure is likely to be especially strong if it comes from an important country such as Mexico.

The claim that this could be a serious risk ignores that the Federal Reserve already receives criticism, because its actions already affect even countries that have separate domestic currencies and floating

exchange rates. Furthermore, the quarter- and half-percentage point increases in interest rates that the Federal Reserve makes are puny compared to the 10- and 20-percentage point increases that central banks have made in such countries as Brazil, Ecuador, Indonesia, and Russia in the last two years.

As has been mentioned, the most effective way of insulating the Federal Reserve from political pressure, whether foreign or domestic, is to revise statute law to give the Federal Reserve a clearer mandate, making price stability its sole goal.

Another risk is the possibility that a large dollarized country, or a group of smaller countries, will suddenly reintroduce domestic currencies and precipitate mass dumping of dollars, forcing the Federal Reserve to increase interest rates if it wants to keep inflation low. As long as the dollar continues to be trustworthy, though, people are unlikely to dump dollars all at once. The best way to prevent mass dumping of dollars is for the dollar to continue the good performance it has sustained, especially since the early 1980s.

Benefits. If even one medium-size country such as Argentina or a number of small countries such as El Salvador dollarize, the United States is likely to gain more in new seigniorage than it loses from sharing seigniorage with already dollarized economies. Holdings of the dollar monetary base seem to be growing faster abroad than in the United States, whereas the formula for sharing seigniorage assumes that holdings grow equally fast in all dollarized countries. Accordingly, the United States will gain more in seigniorage than it otherwise would if the offer to share seigniorage encourages dollarization in countries that otherwise would have continued to issue their own currencies. In the future, should electronic money in the form of credit and debit cards replace most notes and coins in circulation, in effect capturing seigniorage for issuers and users of electronic money, the United States will probably be in the forefront of the change because it is rich and technologically advanced. Again, the formula for sharing seigniorage will probably give somewhat more to the United States than its actual share of the dollar monetary base.

Dollarization will nearly eliminate currency risk and will eliminate currency conversion fees that tourists and businesses alike pay. The gains will be small in proportion to the U.S. economy, and will depend on how many countries dollarize. The larger gains will come from higher economic growth in dollarized countries, which will increase their demand for American goods. Roughly one-third of U.S. trade in goods is with Japan and Western Europe, which are unlikely ever to dollarize because they already have relatively good currencies. But Mexico, which is gaining on Japan to become the second leading

trading partner of the United States, might dollarize, and even Canada, the leading trading partner, might consider it.

By increasing the number of countries that use the dollar, dollarization will help the dollar remain the premier international currency, a status that the euro is now challenging. Dollarization by one or more large Latin American countries would significantly expand the number of people officially using the dollar, moving the population of the dollar zone well ahead of the population of the euro zone.

Dollarization should reduce complaints by American producers about foreign dumping of goods by ending the possibility that dollarized countries can devalue against the dollar. Much controversy about dumping arises because large unexpected devaluations suddenly make the goods much cheaper than they were before, not because of any technological advantage, but because of capricious exchange rate policies. It is notable that recent controversy over imports of steel concerned Russia and Brazil, whose currencies have depreciated greatly.

It is difficult to measure the precise extent to which faster economic growth in dollarized countries would benefit the U.S. economy, but it is clear that there would be a benefit. The faster other economies grow, the faster their demand for U.S. products tends to grow. Since annual seigniorage from the dollar is only about 0.3 percent the size of U.S. gross domestic product, and the annual increase in seigniorage is only about 0.01 percent of GDP, the potential exists for the growth effects of sharing seigniorage to be much larger for the United States than the gains to be had from not sharing seigniorage and not encouraging countries to dollarize.

9. COSTS AND BENEFITS FOR DOLLARIZING COUNTRIES

For many countries, the benefits of dollarization appear to outweigh the costs by far. However, the purpose of examining the costs and benefits for them is not to tell any particular country it should dollarize, but to explain why some countries may wish to dollarize.

Costs. The main readily identifiable cost of dollarization for dollarizing countries is that of acquiring additional dollar assets, if existing foreign reserves are insufficient to convert all domestic currency in circulation into dollars. Note again that to become dollarized, a country only need convert currency in circulation (or at most the domestic-currency monetary base, M0) into some form of the dollar monetary base. It need not convert broader measures of the

money supply that include bank deposits, such as M1, M2, and M3; domestic-currency bank deposits will become dollar bank deposits, not dollar notes. (However, just as depositors can convert domestic-currency bank deposits into domestic-currency notes if they choose, they will be able to convert dollar deposits into dollar notes if they choose.) For a number of reasons, the costs of dollarization are lower than have generally been claimed in previous writings by economists (Bogetic and Schuler 1999, Moreno 1998).

Since the standing offer will give dollarizing countries a share in seigniorage equal to the dollar value of their domestic currency in circulation plus a proportionate share in the average growth of the dollar monetary base, it will eliminate the loss of seigniorage that they would experience from dollarizing unilaterally (which they are still free to do if they wish, and which they can accomplish without permission from the United States).

The loss of flexibility for the domestic government to determine monetary policy (especially the rate of inflation) and the lack of a domestic central bank as a lender of last resort are often considered to be costs of dollarization. However, as has been mentioned, historical experience indicates that developing countries with central banks have generally had worse currencies and lower economic growth than developing countries without central banks (Ghosh and others 1998, Hanke 1999, Hausmann and others 1999, Schuler 1996). The worst banking crises and costliest bank rescues of recent years have occurred in developing countries with central banks, suggesting that in developing countries the existence of a central bank hurts more than helps financial stability (see Caprio and Klingebiel 1996; Lindgren and others 1996, pp. 21-35, 76-7).

A related cost that is similarly hypothetical is the possibility that the United States and, say, Argentina are not what economists term an optimum currency area. The problem with the standard theory of optimum currency areas is that it looks at currencies from the viewpoint of how to centrally plan currency management instead of asking what currencies consumers prefer (White 1989). In many countries consumers obviously prefer the dollar to the domestic currency, which indicates that they consider that their countries *are* in fact part of an optimum currency area with the United States. They continue to use domestic currency to some extent mainly because laws prop it up with special privileges not granted to the dollar or other foreign currencies. There is a way for governments to test whether the domestic currency is as well liked as they think: offer government workers a choice of being paid their fixed wages either in domestic currency, or in dollars at today's exchange rate. In Mexico, for example, a government worker earning a fixed wage of 950 pesos a

week over the next year would have the choice of receiving 950 pesos every payday or \$100, since the current exchange rate of the peso is about 9.5 pesos per dollar. If most government workers prefer to be paid in dollars it is a sign that they consider dollarization desirable.

A final possible cost is that because dollarization brings interest rates in a dollarized country into close correspondence with interest rates in the United States, it tends to synchronize business cycles more closely than might happen if a country retains a central bank. There may be times when a country can grow faster if it has its own central bank that can lower interest rates. That is true even within the United States. Oil is a major product of Texas, so high oil prices have benefited economic growth in Texas while hurting growth in most other U.S. states, while low oil prices have hurt growth in Texas while benefiting growth in most other states. Rather than having a separate currency and manipulating it in response to fluctuations in the price of oil, though, Texans use the dollar. The Federal Reserve orients monetary policy to the needs of the United States as a whole, not to the specific needs of Texas or any other state. Over the long term, it is clear that Texans have benefited from using the dollar rather than having a separate currency like Mexico or Venezuela, two other large oil producers. Rather than looking at isolated short-term instances where a country can grow faster if it has its own central bank, one must think of the long term. The United States has had better long-term economic growth than most other countries in part because monetary policy has been better than in most other countries.

Benefits. Dollarization nearly eliminates devaluation risk with other dollarized countries and with the United States. No monetary system can completely eliminate devaluation risk, because a country can always reintroduce a domestic currency, but dollarization is harder to reverse than other monetary reforms. Dollarization eliminates a distinct domestic currency and disperses formerly centralized foreign reserves. Reintroducing a domestic currency and then devaluing it is harder than devaluing an existing domestic currency.

By nearly eliminating devaluation risk, dollarization promotes investment and reduces interest rates. In Latin American countries that allow banks to lend within the country both in dollars and in domestic currency, interest rates in dollars are lower. Interest rates contain a premium for expected inflation, and where expected inflation is high, interest rates are high, even if the inflation does not materialize. Lower interest rates benefit consumers, businesses, and the government alike by reducing their cost of borrowing. For most Latin American countries, dollarization should make interest rates fall to U.S. levels plus no more than about 4 percentage points of risk premium, as is the case in Panama (see Table 4 above and the IMF 1999).

Dollarization eliminates balance of payments crises. Under dollarization, Panama does not worry about its balance of payments any more than Puerto Rico or Pennsylvania does. Because no separate domestic currency exists, there is no need to defend it by imposing exchange controls. If, as in Panama, dollarization is combined with a banking system that is "internationalized" (highly open to foreign participation, including unrestricted branch banking), flows of capital are little more noticeable than they are within the United States. They are not confined within national boundaries, as happens when a separate domestic currency creates devaluation risk. Hence they tend not to create the type of booms and busts based on capital flows that East Asia has experienced in recent years. In an internationalized banking system, banks look globally at opportunities for lending and borrowing dollars, smoothing flows of capital among all the countries and regions that officially use the dollar. Dollarization in fact encourages internationalization of the financial system.

Since the United States has lower inflation than most developing countries, dollarization will reduce inflation for them. In the last 30 years, more than five-sixths of developing countries with central banks have suffered at least one year of inflation exceeding 20 percent, and more than one-third have suffered at least one year of inflation exceeding 100 percent (Schuler 1996, p. 28). Dollarization will prevent them from repeating their experience.

All these benefits of dollarization foster economic growth. The Argentine government has estimated that dollarization would increase economic growth there by 2 percentage points a year (Warn 1999). That is almost ten times the value of seigniorage that Argentina collects from having a domestic currency--\$750 million a year, approximately 0.22 percent of GDP.

Dollarization does not by itself guarantee growth--other economic policies must also be favorable to it--but by eliminating bad domestic currencies, dollarization eliminates one of the biggest obstacles to growth in many countries.

10. CONCLUSION

This study has investigated a particular arrangement for sharing dollarization, an arrangement that is simple and easy to implement. An implemented version may need to differ in some details. In particular, further thought needs to be devoted to whether to use currency in circulation or the monetary base as the basis for calculating shares of seigniorage; whether the Federal Reserve System should accept gold that dollarizing countries have on deposit at the Federal Reserve Bank of New York in exchange for dollars; whether dollarizing countries

should fulfill any other criteria other than those described to qualify to share seigniorage; and what should be the division of labor between the Federal Reserve and the Treasury Department to administer the sharing of seigniorage.

Few currencies have a long-term record as good as the dollar. Because the dollar has performed relatively well, people in many countries prefer dollars to domestic currency. Unofficial dollarization is already widespread, particularly in Latin America and the former Soviet Union. People in those countries have voted with their wallets for the dollar. Official dollarization would simply give people what they want. The United States should not pressure any country to become officially dollarized. However, by offering to share seigniorage, the United States can remove an important obstacle to official dollarization, and benefit both itself and other countries by doing so.

Prepared by Kurt Schuler, Senior Economist to the Chairman.

This staff report reflects the views of the author only. These views do not necessarily reflect those of the Joint Economic Committee, its Chairman, Vice Chairman, or any of its Members.

APPENDIX: PANAMA'S EXPERIENCE WITH DOLLARIZATION

Panama broke away from Colombia to become independent in 1903. Because of the Panama Canal, Panama has long had important trade and financial links with the United States. Since 1904, Panama has officially used U.S. dollar notes as domestic currency. (Before that, dollars had been circulating unofficially.) Panama has a domestic currency, the balboa (1 balboa = 1 dollar), but it circulates only as coins. The balboa is also used as the unit of account for paying wages and so forth, but that does not affect at all the amounts that are paid. Panama has no central bank and no centralized foreign reserves. The government-owned Banco Nacional de Panamá operates as a commercial bank that does all the banking business of the government and has some business with the private sector. It also acts as a clearinghouse, though banks sometimes clear payments directly between themselves. If Citibank Panama lends Chase Manhattan Bank Panama \$10 million, they may make the payment through their New York head offices.

A 1970 law liberalized Panama's financial markets and allowed full entry by foreign banks. Foreign banks have the majority of assets in the banking system, though much of their assets are foreign deposits placed in Panama because of its role as an international financial center. Panama has no exchange controls. Dollarization plus an internationalized financial system mean that Panama is well integrated into world financial markets. Despite having experienced large inflows and outflows of capital, Panama has avoided the booms and busts that have resulted from such flows in other Latin American countries.

Panama's economic performance has been better than average for Latin America. Inflation averaged 3.5 percent a year from 1971 to 1997, which was lower than in any other Latin American country and the United States. Economic growth per person averaged 1.7 percent a year in the same period. The rather low rate of growth results mainly from laws that make wages unnecessarily rigid and from tariff barriers—an example of how dollarization eliminates some but not all obstacles to rapid economic growth. There have been no system-wide banking crises, and the banking system even survived intact the problems of 1987-9, caused by a domestic political crisis, a U.S. embargo and military invasion, and the resulting economic contraction (Moreno 1999).

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Basics of Dollarization in

**July 1999
(updated January 2000)**

**Joint Economic Committee
Staff Report
Office of the Chairman,
Senator Connie Mack**

SUMMARY

Dollarization occurs when residents of a country extensively use foreign currency alongside or instead of the domestic currency. Dollarization can occur unofficially, without formal legal approval, or it can be official, as when a country ceases to issue a domestic currency and uses only foreign currency. The idea of dollarization has gained prominence in the last year because several countries have considered official dollarization. As of late January 2000, Ecuador is seriously considering it.

Since interest in official dollarization is fairly new, published information on the subject is scarce, though it has been expanding in the six months since the original version of this study appeared. This study explains the basic features of dollarization: what varieties it takes, where it exists, how it works, what the costs and benefits of official dollarization are, and what issues arise in implementing official dollarization.

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1. INTRODUCTION

Dollarization occurs when residents of a country extensively use the U.S. dollar or another foreign currency alongside or instead of the domestic currency. Unofficial dollarization occurs when individuals hold foreign-currency bank deposits or notes (paper money) to protect against high inflation in the domestic currency. Official dollarization occurs when a government adopts foreign currency as the predominant or exclusive legal tender.

Unofficial dollarization has existed in many countries for years. It has attracted much study by economists, but far less political attention because it is to a certain extent beyond the control of governments. Dollarization has been in the news lately because of interest in *official* dollarization. In early 1999 the government of Argentina stated that it sought a formal agreement with the United States to become officially dollarized. Argentina or any other country can become officially dollarized even without a formal agreement, but there may be economic and political benefits to a formal agreement. Argentina's action sparked discussion of official dollarization in other Latin American countries, including Ecuador. On January 9, 2000, Ecuador's president proposed dollarization as a way of helping his country out of a deep recession and political turmoil. On January 21 political unrest forced him out of office, but his successor has expressed support for dollarization. As of late January it remains to be seen whether Ecuador will implement dollarization. On January 24, administrators of the United Nations announced that for the time being, the dollar will be the official currency of East Timor, which recently regained independence from Indonesia.

The largest independent country that currently has official dollarization is Panama. However, dollarization potentially has widespread application in developing countries because few have currencies that have performed as well as the U.S. dollar. Consider a simple three-part test of currency quality from 1971 (the last year of the gold standard) to the present: no years of inflation over 20 percent, loss of value against the dollar of no more than 25 percent, and no restrictions on buying foreign currency since the end of the gold standard. The United States passes the test, but among developing countries that are members of the International Monetary Fund (IMF), only Panama passes. This indicates that many developing countries could have had much higher-quality currencies by replacing their domestically issued currencies with the dollar. Had they not wanted to use the dollar, they could also have done well by using the German mark or Japanese yen, the two other leading international currencies.

Until 1999, official dollarization received practically no attention because it was considered a political impossibility. Published information on official dollarization is therefore scarce, though it has been expanding since the original version of this study appeared in July 1999.¹ To make information more widely available, this report explains the basic features of dollarization: what varieties it takes, where it exists, how it works, what the costs and benefits of official dollarization are, and what issues arise in implementing official dollarization.

A previous Joint Economic Committee staff report (JEC 1999) focused on official dollarization from the standpoint of the United States and discussed “dollarization” in terms of the U.S. dollar only. This report has a broader focus, so “dollarization” here refers to any foreign currency used alongside or instead of the domestic currency, whether officially or unofficially. Official dollarization using the U.S. dollar will, however, receive special emphasis since it is the variety of dollarization most relevant for policy discussion in the United States. This report focuses on practical aspects of dollarization. A companion staff report from the Senate Banking Committee (Stein 1999a) surveys economic arguments for and against official dollarization.

2. VARIETIES OF DOLLARIZATION

Dollarization has three main varieties: unofficial dollarization, semiofficial dollarization, and official dollarization.

Unofficial dollarization. Unofficial dollarization occurs when people hold much of their financial wealth in foreign assets even though foreign currency is not legal tender. (Legal tender means that a currency is legally acceptable as payment for all debts, unless perhaps the parties to the payment have specified payment in another currency. Legal tender differs from forced tender, which means that people must accept a currency in payment even if they would prefer to specify another currency.) The term “unofficial dollarization” covers both cases where holding foreign assets is legal and cases where it is illegal. In some countries it is legal to hold some kinds of foreign assets, such as dollar accounts with a domestic bank, but illegal to hold other kinds

¹ See in particular the conference papers from the Instituto Tecnológico Autónomo de México and the Inter-American Development Bank, available online and listed at the end of the references. The Federal Reserve Bank of Dallas will hold a conference March 5-6, 2000. Because of interest in official dollarization in Latin America, almost as much has been written on the subject in Spanish as in English; the most comprehensive work so far in either language is Schuldt (1999).

of foreign assets, such as bank accounts abroad, unless special permission has been granted.

Unofficial dollarization can include holding any of the following:

- Foreign bonds and other nonmonetary assets, generally held abroad.
- Foreign-currency deposits abroad.
- Foreign-currency deposits in the domestic banking system.
- Foreign notes (paper money) in wallets and mattresses.

Unofficial dollarization often occurs in stages that correspond to the textbook functions of money as a store of value, means of payment, and unit of account. In the first stage, which economists sometimes call “asset substitution,” people hold foreign bonds and deposits abroad as stores of value. They do so because they want to protect against losing wealth through inflation in the domestic currency or through the outright confiscations that some countries have made. In the second stage of unofficial dollarization, which economists sometimes call “currency substitution,” people hold large amounts of foreign-currency deposits in the domestic banking system (if permitted), and later foreign notes, both as a means of payment and as stores of value. Wages, taxes, and everyday expenses such as groceries and electric bills continue to be paid in domestic currency, but expensive items such as automobiles and houses are often paid in foreign currency. In the final stage of unofficial dollarization, people think in terms of foreign currency, and prices in domestic currency become indexed to the exchange rate.

Where unofficial dollarization exists. Measuring the extent of unofficial dollarization is difficult. Accurate statistics on how much people hold in foreign bonds, bank deposits, or notes and coins are usually unavailable. However, estimates of the extent to which notes of the U.S. dollar and a few other currencies circulate outside their countries of origin give a rough idea of how widespread unofficial dollarization is. Researchers at the Federal Reserve System estimate that foreigners hold 55 to 70 percent of U.S. dollar notes, mainly as \$100 bills (Porter and Judson 1996, p. 899). The amount of dollar currency in circulation is currently about \$480 billion, which implies that foreigners hold roughly \$300 billion. A study by the Bundesbank, Germany’s central bank, estimates that foreigners hold 40 percent of German mark notes (Seitz 1995).

Another way to measure unofficial dollarization is by the proportion of foreign-currency deposits in the domestic banking system. A recent survey of selected developing countries by the IMF

found 52 that were highly or moderately dollarized as of 1995 (Baliño and others 1999, pp. 2-3).² The notes to Table 1 list the countries.

In most unofficially dollarized countries, the U.S. dollar is the foreign currency of choice. That is particularly true in Latin America and the Caribbean, where the United States is the largest or second-largest trading partner and the largest source of foreign investment for almost every country. Russia is also dollarized unofficially to a large extent: it has been estimated that Russians hold as much as \$40 billion of dollar notes (Melloan 1998). The German mark is the foreign currency of choice in the Balkans. Like the French franc, Italian lira, Spanish peseta, and a number of other Western European currencies, the mark is now a subdivision of the European euro. Euro notes and coins will replace national notes and coins throughout the "Euroland" in 2002. The euro should then become a stronger rival to the dollar as the foreign currency of choice in the former Soviet Union, Africa, and the Middle East.

Table 1 lists countries that have unofficial dollarization in the sense of widespread use of any foreign currency, not just the U.S. dollar. The dollar and the German mark are the only currencies so widely used outside their countries of origin as to have worldwide significance. The use of other currencies abroad is limited; in particular, despite the large size of Japan's economy, the Japanese yen seems to be little used abroad.

Semiofficial dollarization. More than a dozen countries have what might be called semiofficial dollarization or officially bimonetary systems. Under semiofficial dollarization, foreign currency is legal tender and may even dominate bank deposits, but plays a secondary role to domestic currency in paying wages, taxes, and everyday expenses such as grocery and electric bills. Unlike officially dollarized countries, semiofficially dollarized ones retain a domestic central bank or other monetary authority and have corresponding latitude to conduct their own monetary policy. Table 1 lists semiofficially dollarized countries.

Official dollarization. Official dollarization, also called full dollarization, occurs when foreign currency has exclusive or predominant status as full legal tender. That means not only is foreign currency legal for use in contracts between private parties, but the government uses it in payments. If domestic currency exists, it is

² Extensive foreign-currency deposits are not confined to developing countries: in Britain they exceeded 15 percent of the total in 1995. However, foreign-currency deposits in developed countries typically result from involvement in international finance rather than from people seeking to hedge against high inflation in the domestic currency.

Table 1. Unofficially and Semiofficially Dollarized Countries as of January 2000

Unofficially dollarized--U.S. dollar: Most of Latin America and the Caribbean, especially Argentina, Bolivia, Mexico, Peru, and Central America; most of the former Soviet Union, especially Armenia, Azerbaijan, Georgia, Russia, and Ukraine; various other countries, including Mongolia, Mozambique, Romania, Turkey, and Vietnam.

Semiofficially dollarized--U.S. dollar: Bahamas, Cambodia, Haiti, Laos (also Thai baht), Liberia.

Unofficially dollarized--other currencies: *French franc*--some former French colonies in Africa; *German mark*--Balkans; *Hong Kong dollar*--Macau and southern China; *Russian ruble*--Belarus.

Semiofficially dollarized--other currencies: Bhutan (Indian rupee); Bosnia (German mark, Croatian kuna, Yugoslav dinar); Brunei (Singapore dollar); Channel Islands, Isle of Man (British pound); Lesotho (South African rand); Luxembourg (Belgian franc); Montenegro (German mark, Yugoslav dinar); Namibia (South African rand); Tajikistan (use of foreign currencies permitted--Russian ruble widespread).

Notes: Unofficial dollarization is hard to measure. An IMF survey based on data of foreign-currency deposits alone classifies 18 countries as "highly dollarized" as of 1995, meaning foreign-currency deposits exceeded 30 percent of a broad measure of the money supply. The countries are Argentina, Azerbaijan, Belarus, Bolivia, Cambodia, Costa Rica, Croatia, Georgia, Guinea-Bissau, Laos, Latvia, Mozambique, Nicaragua, Peru, São Tomé and Príncipe, Tajikistan, Turkey, and Uruguay. The survey classifies as "moderately dollarized" another 34 countries, where foreign-currency deposits averaged 16.4 percent of a broad measure of the money supply. Those countries are Albania, Armenia, Bulgaria, Czech Republic, Dominica, Ecuador, Egypt, El Salvador, Estonia, Guinea, Honduras, Hungary, Jamaica, Jordan, Lithuania, Macedonia, Malawi, Mexico, Moldova, Mongolia, Pakistan, Philippines, Poland, Romania, Russia, Sierra Leone, Slovak Republic, Trinidad and Tobago, Uganda, Ukraine, Uzbekistan, Vietnam, Yemen, and Zambia (Baliño and others 1999, pp. 2-3).

Semiofficially dollarized countries are those that the IMF (1998) identifies as having foreign currency as "other legal tender," meaning that foreign currency circulates widely but plays a secondary legal role to the domestic currency.

confined to a secondary role, such as being issued only in the form of coins having small value.

Officially dollarized countries vary concerning the number of foreign currencies they allow to be full legal tender and concerning the relationship between domestic currency--if it exists--and foreign currency. Official dollarization need not mean that just one or two foreign currencies are the only full legal tenders; freedom of choice can provide some protection from being stuck using a foreign currency that becomes unstable. Most officially dollarized countries give only one foreign currency status as full legal tender, but Andorra gives it to both the French franc and the Spanish peseta. In most dollarized countries, private parties are permitted to make contracts in any mutually agreeable currency.

Some dollarized countries do not issue domestic currency at all, while others, such as Panama, issue it in a secondary role. Panama has a unit of account called the balboa equal to the dollar and issues coins but not notes. In practice, there is no difference between the balboa and the dollar; the balboa is simply the Panamanian name for the dollar.

Where official dollarization exists. Many countries have used foreign currency at some point in their history: in the United States, foreign coins were legal tender until 1857.³ As Table 2 shows, 29 countries today officially use the U.S. dollar or some other foreign currency as their predominant currency. Of those, 15 are territories that are not independent, such as the U.S. Virgin Islands. With minor exceptions they use the currency of their "mother" country. The table includes only dependencies that have a high degree of self-government, but there are some borderline cases that other observers might count as being part of the mother country.

Of the 14 officially dollarized countries that are independent, Panama is several times larger in population and economy than all the rest combined. As of 1997, Panama had 2.7 million people and a gross domestic product (GDP) of \$8.7 billion. Independent officially dollarized countries use either the currency of a large neighbor or, in the case of Pacific Ocean islands, the currency of their former colonial power. Official dollarization is rare today except among very small countries because of the political symbolism of a national currency and economic factors such as the perceived costs of dollarization. Argentina, which brought official dollarization to its current prominence, has 33 million people and a GDP of about \$300 billion, so official dollarization there would be a giant leap in scale compared to the countries where it now exists. Yet compared to the United States,

³ At the time, Americans predominantly used coins rather than notes in retail trade.

Table 2. Officially Dollarized Countries

Country	Population	GDP (\$bn)	Political status	Currency	Since
Andorra	73,000	1.2	independent	French and Spanish currencies, own coins	1278
Cocos (Keeling) Islands	600	0.0	Australian external territory	Australian dollar	1955
Cook Islands	18,500	0.1	New Zealand self-governing territory	N.Z. dollar	1995
Cyprus, Northern	180,000	1.4	de facto independent	Turkish lira	1974
<i>East Timor</i>	<i>857,000</i>	<i>0.2</i>	<i>independent</i>	<i>U.S. dollar</i>	<i>2000</i>
Greenland	56,000	0.9	Danish self-governing region	Danish krone	prior to 1800
<i>Guam</i>	<i>160,000</i>	<i>3.0</i>	<i>U.S. territory</i>	<i>U.S. dollar</i>	<i>1898</i>
Kiribati	82,000	0.1	independent	Australian dollar, own coins	1943
Liechtenstein	31,000	0.7	independent	Swiss franc	1921
<i>Marshall Islands</i>	<i>61,000</i>	<i>0.1</i>	<i>independent</i>	<i>U.S. dollar</i>	<i>1944</i>
<i>Micro-nesia</i>	<i>120,000</i>	<i>0.2</i>	<i>independent</i>	<i>U.S. dollar</i>	<i>1944</i>
Monaco	32,000	0.8	independent	French franc/euro	1865
Nauru	10,000	0.1	independent	Australian dollar	1914
Niue	1,700	0.0	New Zealand self-governing territory	N.Z. dollar	1901
Norfolk Island	1,900	0.0	Australian external territory	Australian dollar	Prior to 1900?
<i>Northern Marianas</i>	<i>48,000</i>	<i>0.5</i>	<i>U.S. commonwealth</i>	<i>U.S. dollar</i>	<i>1944</i>
<i>Palau</i>	<i>17,000</i>	<i>0.2</i>	<i>independent</i>	<i>U.S. dollar</i>	<i>1944</i>

Table 2 (continued)

Country	Population	GDP (\$bn)	Political status	Currency	Since
<i>Panama</i>	<i>2.7 mn</i>	<i>8.7</i>	<i>independent</i>	<i>U.S. dollar, own coins</i>	<i>1904</i>
<i>Pitcairn Island</i>	<i>42</i>	<i>0.0</i>	<i>British dependency</i>	<i>N.Z. and U.S. dollars</i>	<i>1800s</i>
<i>Puerto Rico</i>	<i>3.8 mn</i>	<i>33.0</i>	<i>U.S. commonwealth</i>	<i>U.S. dollar</i>	<i>1899</i>
Saint Helena	5,600	0.0	British colony	British pound	1834
<i>Samoa, American</i>	<i>60,000</i>	<i>0.2</i>	<i>U.S. territory</i>	<i>U.S. dollar</i>	<i>1899</i>
San Marino	26,000	0.1	independent	Italian lira, own coins	1897
Tokelau	1,500	0.0	New Zealand territory	N.Z. dollar	1926
<i>Turks and Caicos Is.</i>	<i>14,000</i>	<i>0.1</i>	<i>British colony</i>	<i>U.S. dollar</i>	<i>1973</i>
Tuvalu	11,000	0.0	independent	Australian dollar, own coins	1892
Vatican City	1,000	0.0	independent	Italian lira, own coins	1929
<i>Virgin Is., British</i>	<i>18,000</i>	<i>0.1</i>	<i>British dependency</i>	<i>U.S. dollar</i>	<i>1973</i>
<i>Virgin Is., U.S.</i>	<i>97,000</i>	<i>1.2</i>	<i>U.S. territory</i>	<i>U.S. dollar</i>	<i>1934</i>
United States	268 mn	8,100	independent	U.S. dollar	1700s

Sources: CIA 1998; *The Statesman's Year-Book*; IMF 1998; World Bank 1999.

Notes: *Italics* indicate countries using the U.S. dollar. Population and gross domestic product (GDP) are 1997 or most recent prior year available. The United States (**bold**) is included for comparison.

As of mid January 2000, Ecuador is debating official dollarization. Kosovo, which uses the German mark as its official currency, is not on the list because it is still officially part of Serbia.

the economy of Argentina or any other developing country is small. Argentina's economy is nearly the same size as Michigan's--3.4 percent of the U.S. economy.

Performance of dollarized countries. The economic performance of unofficially and semiofficially dollarized countries has been highly variable, but generally unimpressive. One reason is that their domestic currencies have often been of low quality, and have hampered economic growth by causing high inflation and other problems. Laws that compel people to use the domestic currency, especially for payment of wages and taxes, create some artificial demand even for a low-quality domestic currency.

There seem to be no studies that systematically compare the performance of *officially* dollarized countries with the performance of countries having other monetary systems. Part of the explanation is that data are hard to find except for Panama. Panama has had respectable though not spectacular economic growth, an average rate of inflation even lower than that of the United States, and no major bank failures. Interest rates for retail borrowers and lenders have been roughly two percentage points higher than rates in the United States, while interbank rates have been even closer to U.S. levels. Other than the U.S. commonwealth of Puerto Rico, Panama is the only Latin American country where private lenders are willing to make 30-year fixed-rate mortgages. A previous report (JEC 1999, p. 33) summarized Panama's performance, and detailed information is available elsewhere (Moreno-Villalaz 1999).

Although systematic studies focusing on officially dollarized countries are lacking, more general studies exist. They compare the performance of developing countries with central banks to developing countries with more rule-bound monetary systems, including official dollarization and currency boards. These studies find that the more rule-bound monetary systems have generally outperformed central banking in developing countries (Ghosh and others 1998, Hanke 1999, Hausmann and others 1999, Schuler 1996). Another important but frequently neglected body of evidence comes from internal rather than cross-country experience. Official dollarization works much like the monetary system among regions of a single country: Panama has much the same relationship to New York that Pennsylvania and Puerto Rico do. Among regions of a single country, monetary systems typically operate without many of the problems that arise at the international level because countries have separate currencies (Ingram 1962).

3. HOW DOLLARIZATION WORKS

Unofficial dollarization. Most studies economists have written about dollarization have concerned unofficial dollarization, especially its “currency substitution” phase. (That is the phase at which people use foreign currency to pay for expensive items even though legally they are supposed to use the domestic currency.) The findings of the studies have varied widely because unofficial dollarization has mixed effects. On the one hand, it can make demand for the domestic currency unstable. If people switch into foreign currency suddenly, that can cause the domestic currency to depreciate, starting an inflationary spiral. Where people hold extensive foreign-currency deposits, a change in domestic or foreign interest rates can trigger large shifts from one currency to the other, as a means of speculating about the exchange rate. Such shifts complicate the job of a central bank that is trying to target the domestic money supply.

On the other hand, unofficial dollarization provides a hedge against inflation in the domestic currency and can increase the stability of the banking system. Allowing domestic banks to accept deposits in foreign currency means that depositors do not have to send their money out of the country when they want to switch it into foreign currency. The risk of a currency devaluation causing a bank run therefore becomes smaller. In some cases the “instability effect” on the demand for money is more important, while in other cases the “stability effect” on the banking system is more important. Accordingly, economists are divided about whether unofficial and semiofficial dollarization are desirable or undesirable (see Revista 1992).

Official dollarization. Official dollarization is easier to analyze than unofficial dollarization because by eliminating the domestic currency it eliminates problems from shifts between domestic currency and foreign currency. And since high inflation and other monetary problems in developing countries more often originate from the domestic currency rather than from the most widely used foreign currencies, official dollarization eliminates those problems.

An officially dollarized country is part of a unified currency zone with the country whose currency it uses, hereafter called the issuing country. To repeat, Panama has much the same relationship to New York that Pennsylvania and Puerto Rico do. An officially dollarized country relinquishes an independent monetary policy and “imports” the monetary policy of the country whose currency it uses. Within the unified currency zone, arbitrage--buying and selling to take advantages of differences in prices--tends to keep prices of similar goods within a narrow range. If a computer costs \$500 in the United States, in Panama it cannot cost more than \$500 plus extra taxes and shipping costs,

otherwise it becomes profitable to ship computers from the United States to Panama until the difference in price vanishes. The same is also true of trade in computers between the United States and Mexico, but because Mexico has a separate currency, currency risk imposes extra costs to arbitrage that do not exist for trade between the United States and Panama.

Because arbitrage tends to keep prices of similar goods within a narrow range throughout the unified currency zone, inflation rates tend to be broadly similar throughout the zone. Inflation need not be exactly the same all over the zone, however: prices for goods that are not mobile, particularly real estate and labor, can rise faster than average in fast-growing areas, reflecting that economic growth is making the goods more valuable. There is nothing unusual about that; the same happens to different regions of a single country.

Interest rates also tend to be broadly similar throughout the zone: if 30-year mortgages have an interest rate of 8 percent in the United States, the rate cannot be too much higher in Panama, otherwise it becomes profitable for banks to lend for mortgages in Panama until the difference vanishes. Some difference in interest rates can persist, however, because of country risk (political factors that affect the security of property rights). Interest rates will be most closely synchronized if there is financial integration, which is discussed below.

Just as for a region *within* a country, in an officially dollarized country the supply of money is determined “automatically” by the balance of payments, which itself reflects people’s preferences for holding versus spending money. The issuing country determines the amount of the monetary base in existence (notes and coins in circulation, plus bank reserves). The monetary base then comes to be held by people in various regions or countries according to the intensity of their demand for it. If people want to acquire more foreign-currency notes, they have to spend less, other things being equal; if they have more foreign-currency notes than they want, they can get rid of them by spending more.

As for a region, though, the current-account balance (trade in goods and services) does not rigidly determine the supply of money, because people can also acquire or dispose of spending power through capital-account transactions (trade in financial assets—in other words, obtaining or making loans). Suppose that in one year Panama has sold \$6 billion of goods and services to the rest of the world but has bought \$7 billion; then its current-account deficit for the year is \$1 billion. That does not mean its money supply must contract by \$1 billion. If during the same year Panamanians invest nothing abroad and foreigners invest \$2 billion in Panama, the capital-account surplus is \$2

billion, making the combined surplus \$1 billion and meaning that the money supply can expand rather than contract.

An officially dollarized country cannot respond to economic shocks, such as an increase in the price of oil, by altering the exchange rate of its currency. However, it still has other methods of adjustment at its disposal: flows of capital into or out of the country to offset the shock, changes in the government budget, and changes in prices and (less often) wages. A country experiencing a “real” economic shock ultimately has to adjust by experiencing “real” pain or gain. Altering the exchange rate can perhaps soften but not avoid the need for real adjustment.

Financial integration. If official dollarization goes no further than using a foreign currency, it does not achieve its full potential benefits. An officially dollarized country has a unified currency with the issuing country, but not necessarily an integrated financial system. To achieve financial integration, a country must allow foreign financial institutions to compete with domestic financial institutions. Full financial integration occurs when the law allows financial institutions extensive freedom of action to compete and does not discriminate against foreign institutions. In particular, it means that foreign financial institutions can establish branches, accept deposits and make loans, buy up to 100 percent of domestic institutions, and move funds freely into and out of the country.

Financial integration plus official dollarization using a leading international currency (the dollar, euro, or yen) makes a country part of a large and liquid international pool of funds. Consequently, the location of loans need not be closely linked to the location of deposits. Citibank, for example, does not need to balance its loans and deposits in Panama any more than it needs to balance its loans and deposits in Pennsylvania. It can borrow where the cost of funds is lowest and lend where the risk-adjusted potential for profit is highest anywhere in the dollar zone. The ability of the financial system to switch funds without exchange risk between an officially dollarized country and the issuing country reduces the booms and busts of foreign capital that often arise in countries having independent monetary policies and financial systems not well integrated into the world system. It also helps stabilize the real exchange rate (a measure of the effect of the exchange rate and inflation on the competitiveness of exports [Moreno-Villalaz 1999, pp. 422-4]).

Besides helping to stabilize the economy, financial integration improves the quality of the financial system by allowing consumers access to financial institutions that have proved their competence internationally. That forces domestic financial institutions to be high quality to compete with foreign institutions. Moreover, foreign

financial institutions can lend funds to domestic institutions when domestic institutions lack liquidity. Ready access to foreign funds offers a dollarized country a substitute for the central bank function of a lender of last resort.

4. COSTS AND BENEFITS FOR THE UNITED STATES

Let us now consider the consequences for the United States of more countries using the U.S. dollar as their official currency.

Seigniorage. The revenue from issuing currency is called seigniorage. Net seigniorage is the difference between the cost of putting money into circulation and the value of the goods the money will buy. (Gross seigniorage, a related concept, ignores the cost of putting the money into circulation.)

One way to measure seigniorage is as a stock--a one-time gain. A \$1 bill costs about 3 cents to print, but the U.S. government can use it to buy \$1 worth of goods. If the bill circulated forever, the net seigniorage would be 97 cents. In reality it is less because after about 18 months the average \$1 bill wears out and needs to be replaced; like other governments, the U.S. government replaces worn-out notes and coins free of charge.⁴ More generally, the concept of seigniorage applies not just to the \$1 bill, but to the entire monetary base--notes and coins in circulation, plus bank reserves. Under this approach, gross seigniorage is the change in the monetary base over a given period, divided by the average level of prices during the period if one wants to correct for inflation.

Another way to think of seigniorage is as a flow of revenue over time. Notes and coins pay no interest. Somebody who holds notes could instead buy a bond and earn interest on it. By holding notes it is as if he is giving the issuing government an interest-free loan. Under this approach, gross seigniorage is the average monetary base times some measure of inflation or the interest rate over a given period. The stock measurement is like a landlord thinking about a house in terms of the price he could sell it for in cash, while the flow measurement is like thinking about the house in terms of what it can earn from monthly rental income. Using an appropriate interest rate to take into account that a dollar in the future is less valuable than a dollar today, the two measurements should be equal.

⁴ The new \$20, \$50, and \$100 bills cost about twice as much to print because they have more elaborate features to protect against counterfeiting, but they also have longer average lives than the \$1 bill.

For the U.S. government, net seigniorage from issuing dollars, as measured by the flow of payments the Federal Reserve System makes to the Treasury, is roughly \$25 billion a year. That is a large amount in dollar terms, but it is less than 1.5 percent of total federal government revenue and only about 0.3 percent of the GDP of the United States. When foreigners hold dollar notes, they create seigniorage for the U.S. government. As was mentioned, foreigners are estimated to hold 55 to 70 percent of the total value dollar notes in circulation, which implies that they account for perhaps \$15 billion a year of the seigniorage from issuing dollars.

Like the United States, other countries earn seigniorage from issuing domestic currency. Under current arrangements, those that become officially dollarized give up the seigniorage. If Argentina were to replace the peso with the dollar, the U.S. government would receive the seigniorage that the Argentine government now receives. That may be as much as \$750 million this year, or around 1.2 percent of Argentina's federal government budget. To reduce the loss of seigniorage as an obstacle to official dollarization, Senator Connie Mack and Representative Paul Ryan introduced the International Monetary Stability Act (S. 1879 and H.R. 3493) in November 1999. A later section discusses the act in more detail.⁵

Possible risks. A possible risk of encouraging official dollarization in other countries is unlikely to make it harder for the Federal Reserve to conduct monetary policy. However, the greatest growth in foreign holdings of dollar notes has apparently occurring in recent years (Judson and Porter 1996, p. 896), and it has been precisely during that period that the Federal Reserve has successfully reduced inflation first to 3 percent and now to less than 2 percent a year.

Another possible risk is that the officially dollarized countries will pressure the United States to assume responsibility for solving their economic problems. But by explicitly disclaiming responsibility to lend to troubled banks in officially dollarized countries or to supervise foreign banking systems, the Federal Reserve System and the Treasury Department can notify countries considering official dollarization that responsibility rests with the domestic government. Officials of the

⁵ Several multinational central banks share seigniorage among their member countries, but the only countries today that earn seigniorage from *foreign* currency circulating within their borders are Lesotho and Namibia. Before they started issuing their own currencies, they used the South African rand, and the exchange rates of their currencies are 1-to-1 with the rand. As part of a formal arrangement called the Common Monetary Area, South Africa shares with them the seigniorage from their estimated use of rand notes. Swaziland and Botswana, which once had similar arrangements with South Africa, no longer do (Collings and others 1978).

Federal Reserve and the Treasury have already emphasized this point repeatedly in public statements.

Still another possible risk is that when the Federal Reserve increases interest rates, officially dollarized countries will pressure it to keep rates inappropriately low. However, as Federal Reserve chairman Alan Greenspan has testified in an April 22 hearing before a Senate Banking subcommittee, the Federal Reserve already receives criticism and withstands it. The policies of the Federal Reserve already affect even countries that have separate domestic currencies and floating exchange rates. Furthermore, the quarter- and half-percentage point increases in interest rates that the Federal Reserve makes are small compared to the 10- and 20-percentage point increases that central banks have made in such countries as Brazil, Ecuador, Indonesia, and Russia in the last two years.

A way to ensure that the Federal Reserve is resistant to political pressure, whether foreign or domestic, is to give the Federal Reserve a clearer mandate, explicitly making price stability its primary long-term goal. To do just that, Senator Connie Mack (R-Florida) has introduced the Economic Growth and Price Stability Act (S. 1492). The act is similar to bills that Senator Mack and Representative Jim Saxton introduced in the previous Congress.

Another risk is the possibility that a large number of foreign users of dollars will suddenly switch to the euro or another currency, causing mass dumping of dollars and forcing the Federal Reserve to increase interest rates to prevent inflation from flaring up. But as long as the dollar continues to be trustworthy, mass dumping is unlikely. The best way to prevent it is for the dollar to continue the good performance of the last 17 or so years.

Benefits. Currency risk (the risk of a currency devaluation or revaluation) would nearly disappear for Americans dealing with officially dollarized countries. With it would disappear the currency conversion fees familiar to tourists and businesses. The direct savings from eliminating those fees would be small, but would open the way to larger indirect savings in the form of higher economic growth in officially dollarized countries because of a better currency and tighter financial links with the United States. That in turn would create higher demand for American goods and higher economic growth in the United States.

By increasing the number of countries that use the dollar, official dollarization would help the dollar remain the premier international currency, a status that the euro is now challenging. Dollarization by one or more large Latin American countries would significantly expand the number of people officially using the dollar, moving the

population of the dollar zone ahead of the population of the euro zone for the time being.

In addition, official dollarization should reduce complaints by American producers about foreign dumping of goods by ending the possibility that dollarized countries could devalue against the dollar. Much of the controversy surrounding dumping arises because large unexpected devaluations suddenly make the goods much cheaper than they were before, not because of any technological advantage, but because of capricious exchange rate policies. It is notable that recent controversy over imports of steel concerned Russia and Brazil, whose currencies have depreciated greatly.

5. COSTS AND BENEFITS FOR OFFICIALLY DOLLARIZING COUNTRIES

In proportion to the size of their economies, many countries that become officially dollarized stand to gain even more than the issuing country does. Because this section does not specifically concern the United States, "official dollarization" is used in the sense that includes any foreign currency, not just the dollar.

Cost of lost seigniorage. In discussing the costs of dollarization, economists have focused on the loss of seigniorage from replacing a domestic currency with a foreign currency. Harkening back to the discussion of seigniorage a few pages ago, one can think of the cost as a one-time stock or, equivalently, as a continuing flow.

The *stock cost* is the cost of obtaining enough foreign reserves necessary to replace domestic currency in circulation. (As is explained later, currency in circulation is more accurate than the monetary base as an indicator of the need for foreign reserves.) In an influential study, Stanley Fischer, who today is the First Deputy Managing Director of the IMF, used data from the 1970s to estimate that the stock cost of official dollarization for an average country would have been 8 percent of gross national product (GNP, a concept closely related to the GDP more commonly used now [Fischer 1982, p. 305]). That is a large amount: for the United States today, it would exceed \$700 billion. However, since the 1970s advances in technology have enabled deposit transfers to replace notes and coins for many types of payments. Because people use notes and coins less than formerly in most countries, the cost of replacing them, expressed as a percentage of GDP, is also less--generally 4 to 5 percent instead of 8 percent.

An alternative way to think about the cost of lost seigniorage is as a *flow cost*--a continuing amount lost year after year. Central banks or other monetary authorities that hold foreign assets hold few or no

foreign notes and coins; rather, they hold bonds and other interest-earning assets. Official dollarization deprives them of the interest. One method of calculating the flow cost is to multiply currency in circulation by the interest rate on foreign assets. Another method is to multiply the monetary base (which, recall, is larger than currency in circulation) by the domestic inflation rate or by some domestic-currency interest rate, which will generally be higher than the interest rate on foreign assets. The first method, which we will call it the “low-end estimate,” is appropriate for a country that wishes to have low inflation and low interest rates; the second method, which we will call the “high-end estimate,” is more appropriate for a country that intends to use high inflation as a tool for generating seigniorage.

Fischer’s calculations, which were a type of low-end estimate, indicated that in the 1970s the average flow cost of officially using the U.S. dollar would have been about 1 percent of GDP per year. In the 1990s, inflation in the United States and many other countries inflation has been significantly lower than it was in the 1970s. Lower inflation translates into lower flow costs, as is apparent from the low-end estimates of Table 3, which are much lower than Fischer’s estimates. Table 3 calculates low-end and high-end estimates of the *gross* flow cost of official dollarization for selected Latin American countries. It assumes, as Fischer did, that officially dollarized countries will not share in the seigniorage earned by the issuing country. To the extent that they do share, the *net* flow cost of official dollarization falls. If, calculated using the interest rate on foreign assets, Argentina’s gross flow cost of using the dollar is 0.2 percent of GDP a year but the United States rebates 85 percent of that amount, as the International Monetary Stability Act proposes, Argentina’s net flow cost is just 0.03 percent of GDP a year.

Other costs. The stock and flow costs of official dollarization are relatively easy to estimate. Other costs range from the quantifiable to the vague.

The **one-time cost of converting prices, computer programs, cash registers, and vending machines from domestic currency to foreign currency** varies considerably across countries. In Argentina, for example, it would be almost zero because the Argentine peso is worth one dollar, so no repricing would be necessary. In Mexico, the cost would be larger because the Mexican peso has a floating exchange rate against the dollar. In countries with high inflation there may even be a net benefit rather than a cost from less frequent need to revise prices and more efficient economic calculation.

Table 3. Estimated Gross Flow Costs of Official Dollarization for Selected Countries

Country	Years	Low-end estimate (% of GDP per year)	High-end estimate (% of GDP per year)
Argentina	1991-6	0.2	0.5
Brazil	1994-6	0.1	1.3
Ecuador	1991-7	0.2	7.4
El Salvador	1991-6	0.2	2.3
Mexico	1991-7	0.2	0.8

Sources: For the low-end estimate, own calculations; for the high-end estimate, Bogetic (1999). Both estimates use data from IMF *International Financial Statistics*.

Notes: The low-end estimate is currency in circulation at the end of the year (line 14a of *International Financial Statistics*) as a percentage of GDP (line 99b) times the average annual interest rate on U.S. commercial paper (line 60bc for the United States). Commercial paper--short-term corporate bonds--is one of the highest-yielding short-term investments that is quite liquid. The high-end estimate is the average annual change in the monetary base (calculated from line 14 of *International Financial Statistics*) times the average annual rate of inflation (calculated from line 64).

Brazil is calculated on the basis of 1994-6 because its hyperinflation of the early 1990s makes costs appear misleadingly large.

Observe that these are estimates of *gross* flow costs, that is, they assume that the issuing country will not share seigniorage with the countries in the table if they became officially dollarized. If the issuing country shares seigniorage, *net* flow costs are less than gross flow costs.

Many economists have claimed that there is a **cost of losing a domestic central bank as a lender of last resort**. The first issue here is whether the government of an officially dollarized country can obtain sufficient funds to save individual banks if it wishes. One solution is to arrange for lines of credit from foreign banks, as the currency board-like system of Argentina has done (BCRA 1998). The branches of foreign banks can also provide credit directly to domestic banks without government involvement, as they have done in Panama. The second issue is whether an officially dollarized system can handle system-wide banking problems. Here it is important to think

comparatively. Officially dollarized countries and other countries without central banks as lenders of last resort have on occasion suffered system-wide problems, but less often and at lower cost to taxpayers than countries with central banks (for a summary, see Frydl 1999). This suggests that not having a central bank may actually be a benefit rather than a cost.

It has also been claimed that there is a **cost of losing flexibility in monetary policy**, such as when the issuing country is tightening monetary policy during a boom while an officially dollarized country really needs looser monetary policy because it is in a recession. In a dollarized monetary system the national government cannot devalue the currency or finance budget deficits by creating inflation, because it does not issue the currency. But in practice, lack of flexibility has been beneficial rather than costly. Contrary to a standard theoretical justification for central banking, in Latin America greater flexibility in monetary policy has made interest rates more rather than less volatile in response to changes in U.S. interest rates (Frankel 1999, Hausmann and others 1999). Again, this suggests that not having a central bank may actually be a benefit rather than a cost.

Benefits. The benefits of official dollarization flow from using a currency that is presumably better than a domestic central bank could provide. Instead of making a laundry list of particular benefits, it is simpler to think in terms of broad classes of benefits.

One class of benefits comes from **lower transaction costs**--the costs of exchanging one currency for another. These costs take the form of a difference between the buying and selling rates for converting domestic currency into foreign currency. Official dollarization *eliminates transaction costs with other countries in the unified currency zone*. Hedging for currency risk with those countries becomes unnecessary, tending to increase trade and investment with them. In the particular case of the U.S. dollar, official dollarization even reduces the transaction costs with other currencies. Large transactions between, say, the Mexican peso and the Japanese yen occur in two legs--a peso-dollar trade and a dollar-yen trade--because those markets are so big and efficient that using them is actually less costly than making a direct peso-yen transaction. Using the dollar would reduce the costs of Mexico's transactions with Japan because it would eliminate one leg of the trade.

Another aspect of lower transaction costs is that without the existence of a separate domestic currency, *banks may be able hold lower reserves*, thereby reducing their cost of doing business. The existence of a distinct domestic currency implies a need for banks to separate, say, their peso and dollar portfolios. With official dollarization the peso portfolio and the dollar portfolio become one big

pool. One study claims that in Panama, official dollarization enables bank reserves to be 5 percent of GDP lower than they would be if Panama had a separate domestic currency (Moreno-Villalaz 1999, p. 437).⁶

A second class of benefits comes from **lower inflation now and lower risk of future inflation**. By using a foreign currency, an officially dollarized country assures itself of a rate of inflation close to that of the issuing country. Using the dollar, euro, or yen would *reduce inflation* to single digits from the double-digit levels that many developing countries now have. Because confidence exists that inflation in the dollar, euro, and yen will continue to be low, they have *low and relatively steady interest rates*.

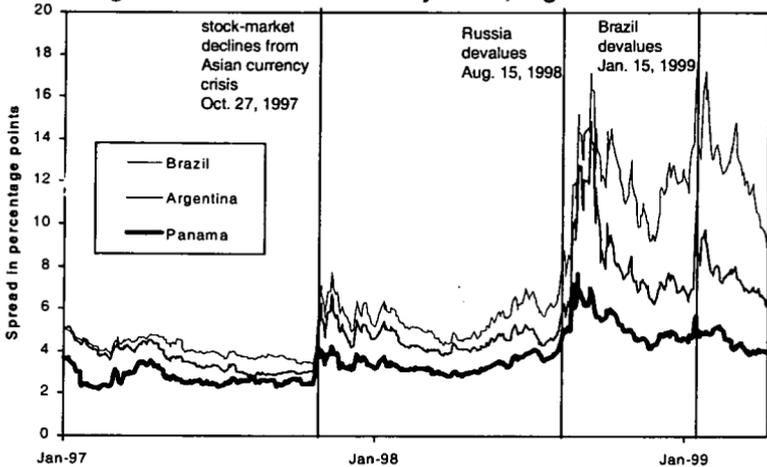
Low inflation *increases the security of private property*. Money is the most widely held form of property. Inflation is a kind of tax on money, and the lower and less variable inflation is, the more secure are property rights in money. Because other financial assets are denominated in money (currency units), low inflation also increases their security, which *encourages saving and long-term lending*. Panama is the only independent Latin American country where 30-year fixed-rate mortgages are available without government subsidies because it is the only one that has not suffered high inflation and currency devaluations in the last 15 years. Low inflation also *helps retirees, people on fixed incomes, and people too poor to have bank accounts* by assuring that their savings retain value.

Figure 1 illustrates the potential of dollarization to reduce interest rates. The figure compares daily data for three countries with different monetary systems: Brazil, which has a central bank; Argentina, which has a currency board-like system linked to the dollar; and Panama, which has official dollarization. Interest rates in the figure are expressed in terms of the spread (premium) that each government has to pay for its *dollar* bonds compared to U.S. Treasury bonds. Since Treasury bonds have virtually zero risk, the spreads reflect "country risk," the possibility that its government will default. Typically, the government pays lower interest rates than any borrower in the country because it has the greatest resources, so the degree of country risk gives a rough idea of the security of private property in a country. Because Panama is not noticeably more politically stable than Argentina or Brazil, it is hard to attribute the lower rates on Panamanian bonds to anything other than the benefits of official dollarization.

⁶ The savings involved is not 5 percent of GDP, but 5 percent times the difference between the lower interest rate the funds would earn as reserves and the higher rate they can earn in other types of investment.

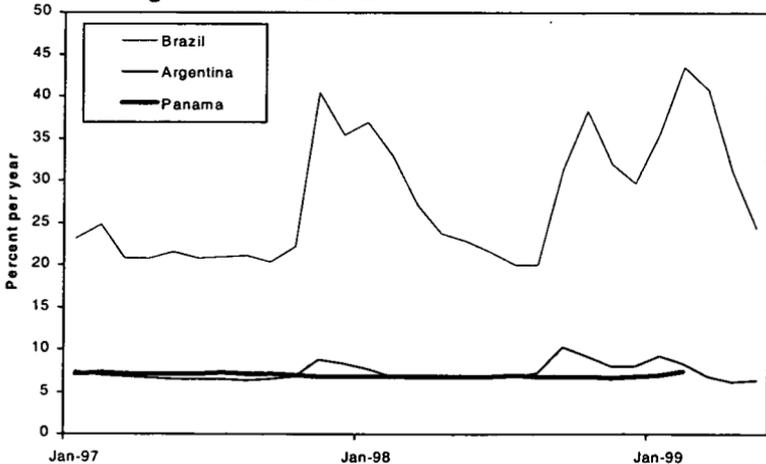
Figure 2 compares monthly data of domestic-currency interest rates for bank deposits in Brazil, Argentina, and Panama. Again, interest rates in Panama are lowest, though rates in Argentina are close.

Figure 1: Spread versus US Treasury securities for US dollar government bonds issued by Brazil, Argentina and Panama



Source: J.P. Morgan Emerging Markets Bond Index Plus.

Figure 2: Domestic-currency deposit interest rates in Brazil, Argentina and Panama



Source: IMF, International Financial Statistics, line 60I.

A final class of benefits comes from **greater economic openness and transparency**, especially on the part of the government. Because there is no domestic currency that needs to be propped up, official dollarization *eliminates balance-of-payments crises and the rationale for exchange controls* (restrictions on buying foreign currency), such as many developing countries have. By eliminating the government's power to create inflation, official dollarization *fosters budgetary discipline*. That need not mean that the government budget must be balanced every year--Panama has run large deficits at times--but it means that deficits must be financed through the fairly transparent methods of higher taxes or more debt rather than through the murky method of printing money.

How do we measure costs and benefits? So far, we have just a list of the costs of official dollarization versus the benefits. The analysis would be better if we could measure them in terms of GDP gained or lost. If official dollarization really is beneficial, it should result in higher economic growth than would otherwise exist. The government of Argentina has estimated that official dollarization there would increase economic growth as much as 2 percentage points of GDP a year. Even if the United States shared no seigniorage, the cost in lost seigniorage would be only about 0.2 percent of GDP a year (BCRA 1999). And as has been mentioned, developing countries without central banks have generally had better monetary and economic performance than those with central banks, which suggests that the benefits of official dollarization would far exceed the costs for most or all countries that are likely candidates.

A different and more satisfactory approach to measuring costs and benefits is to realize that ultimately, it is the evaluations of consumers that determine costs and benefits. Economists' estimates of costs and benefits are just indirect ways of trying to gauge the evaluations of consumers. A "market test" provides direct insight. The way to conduct a market test of currencies is to remove all legal privileges that domestic currency has over foreign currency and see which currency or currencies people prefer to use. Where that is not possible because a government is unwilling to remove the legal privileges of the domestic currency, a high degree of unofficial dollarization strongly suggests that the "consumers" of money--the people who use it--prefer foreign currency and would not use the domestic currency at all if not for its legal privileges.

6. WHICH COUNTRIES ARE CANDIDATES FOR OFFICIAL DOLLARIZATION?

Considering the costs and benefits of official dollarization raises the question of which countries are likely candidates for official dollarization. The answer involves both economics and politics. Note that official dollarization would be a voluntary decision on the part of dollarizing countries. It would be inappropriate for the United States or any other country to pressure a country into official dollarization.

Economic considerations. The main economic consideration that makes a particular country a likely candidate is a history of poor monetary performance that impairs the credibility of its currency. As previously mentioned, most developing countries have such a history. Lack of credibility forces borrowers in that currency to pay high interest rates and reduces economic growth.

The other important economic consideration that makes a country a likely candidate is that it collects little seigniorage from issuing a domestic currency because unofficial dollarization is already extensive. Official dollarization would involve a comparatively small loss of seigniorage, and the loss would be even smaller if the issuing country shared seigniorage.

Many economists propose using the "theory of optimum currency areas" to judge whether official dollarization is desirable. According to the theory, an economy is part of an optimum currency area when a high degree of economic integration makes a fixed exchange rate more beneficial than a floating rate. Unfortunately, economists disagree about how to define optimum currency areas in practice, though they generally agree that an optimum currency area exists where there is a large country that has a dominant currency and where considerable trade, labor, and investment flow between it and its smaller neighbors. The flaw with the theory of optimum currency areas, as economists usually apply it, is that economists presume to determine costs and benefits for consumers, rather than acknowledging that it is the evaluations of consumers that determine the costs and benefits economists must consider. If Argentines prefer to hold dollars, it indicates that for them Argentina is part of an optimum currency area with the United States, no matter what economists may think (see White 1989).

Nevertheless, the theory is useful insofar as it highlights the problems that can arise when neighboring countries have radically different exchange rate policies. Official dollarization would work better in Argentina if Brazil, its largest trading partner, were also dollarized, because then Argentine businesses would not have to worry

about exchange rate risk when trading with Brazil. Since Brazil seems unlikely to become officially dollarized, Argentina is left with options that all involve difficulties. Adopting Brazil's currency would subject Argentina to the many monetary problems Brazil has experienced. Adopting a floating exchange rate for the Argentine peso would risk repeating the hyperinflation Argentina suffered before establishing its currency board-like system in 1991. Sticking with the currency board-like system or establishing official dollarization seem the best choices despite possible problems from further depreciation of Brazil's currency.

Political considerations. The most important political consideration that makes a country a likely candidate for official dollarization is that people do not consider the domestic currency an indispensable element of national identity. (Where there is residual desire to maintain the domestic currency as an element of national identity, domestically issued coins are a potential solution.) Official dollarization promotes globalization, increasing the influence of international economic forces relative to domestic political forces. Debate in various countries about whether that is desirable has centered on the concept of national sovereignty. So far, however, participants in the debate have rarely defined precisely what they mean by national sovereignty, nor have they explained why it should be more important than the principle of "consumers' sovereignty"--the freedom of choice that undergirds a market economy.

Furthermore, national sovereignty is losing its formerly unquestioned status as a basis for designing monetary policy. As globalization proceeds, the politics of monetary policy are changing from a stress on national sovereignty to a stress on regional integration. The most noteworthy example is the advent of the euro to replace national currencies in 11 Western European countries earlier this year. Interest in official dollarization is another manifestation of the change.

There has recently been serious consideration of official dollarization in a number of countries, and more preliminary consideration in others. Moreover, official dollarization has been established or is in the midst of being established in some new countries.

Dollarization in Yugoslavia and East Timor. Montenegro and Serbia comprise the Federal Republic of Yugoslavia, which the United States has not formally recognized. Montenegro is moving towards a separation from Serbia. On November 2, 1999 it declared that the German mark to be legal tender alongside the Serbian-issued Yugoslav dinar. Montenegro is therefore semiofficially dollarized. Montenegro intends to establish a currency board to issue a national currency linked

to the mark. However, the mark and perhaps the dinar will continue to be accepted as legal tender after the new currency enters circulation.

Most of the Serbian province of Kosovo has been under administration by the United Nations since an international force of peacekeepers entered in June 1999. The administration introduced the German mark as Kosovo's official currency on September 3, 1999. It remains permissible to use other currencies, including the Yugoslav dinar (AFP 1999). The mark had been in widespread unofficial use. The United Nations considers Kosovo still part of Serbia, so Table 2 above does not list it as an officially dollarized country.

East Timor, a longtime Portuguese colony, became independent when Portugal dissolved its empire in 1975, but Indonesian military forces invaded later that year. Indonesia granted independence after a referendum of August 30, 1999 indicated very strong support for independence among the East Timorese people. The United Nations has assumed temporary administration of the new nation. On January 24, 2000, the administration, in consultation with the main pro-independence coalition, announced that the U.S. dollar would be East Timor's official currency, although the Indonesian rupiah may be accepted during a transition period and it is legal for private parties to use any mutually acceptable currency (Agnote 2000). It is envisioned that in two or three years East Timor will establish its own currency. A consideration favoring adoption of the U.S. dollar over the Indonesian rupiah, Australian dollar, or Portuguese escudo was that the U.S. dollar is the main currency of international aid, which East Timor will depend heavily upon in the near future.

Official dollarization in Latin America--Argentina. Because of its currency board-like system, Argentina already has a fixed exchange rate with the dollar (1 Argentine peso = \$1) and it holds sufficient dollar reserves for immediate official dollarization if it wishes. Argentina has permitted widespread unofficial dollarization, to the point that most bank deposits and loans occur in dollars.

In January 1999, President Carlos Menem announced that the government was studying the possibility of official dollarization. He was prompted to do so by lingering doubts about the credibility of the currency board-like system. Despite the system's good performance, Argentina has experienced interest-rate spikes in 1992, during Mexico's currency crisis in 1994-5, and during the Asian and Brazil currency crises since 1997. Argentine officials have since discussed with U.S. officials the possibility of entrenching official dollarization through a treaty of monetary association with the United States.

Argentina seeks up to three objectives: a share of seigniorage from use of the dollar in Argentina; access for Argentine banks to the discount window of the Federal Reserve System, enabling them to

borrow in times of stress; and cooperation on bank supervision. They also think that a formal agreement may help economic integration generally to become more politically entrenched (BCRA 1999, Castro 1999). As discussed above, officials of the U.S. Treasury and the Federal Reserve have stated that the United States will not grant access to the discount window nor will it help supervise banks in dollarized countries, but they seemingly remain open to the possibility of sharing seigniorage.

Menem's successor as president, Fernando de la Rúa, took office in December 1999. Argentina has not become officially dollarized, but the possibility remains under active debate.

Ecuador. Argentina's consideration of official dollarization brought the issue to prominence all over Latin America, including Ecuador. Following Brazil's devaluation in January 1999, the Ecuadorian sucre came under increased speculative pressure. It was devalued on March 2; the same day, eight troubled banks closed. On March 11, the government froze deposits in the entire banking system. Discontent about the financial crisis and the deep recession the economy suffered led some observers to propose official dollarization (Cordeiro 1999, López 1999; see also IEEP 2000). On January 9, 2000, President Jamil Mahuad proposed official dollarization as a way of ending the rapid depreciation of the Ecuadorean sucre, which in one year had gone from about 7,000 per dollar to 25,000 per dollar. Political unrest forced Mahuad out of office on January 21. His successor, former vice-president Gustavo Noboa, has indicated support for dollarization, but as of late January 2000 it is still unclear whether and how fast Ecuador will become officially dollarized. Ecuador is already heavily dollarized unofficially. If it becomes officially dollarized it will be the largest independent country to do so. Its population is 12.6 million and its GDP in 1997, before the severe depreciation of the sucre, was \$18.8 billion.

Ecuadorean officials have indicated that the prospect of a rebate of seigniorage from the United States under the International Monetary Stability Act (described below) has favorably influenced their consideration of dollarization.

Central America. In 1994-5 the government of **El Salvador** announced first that it intended to establish a currency board and then that it intended to proceed directly to official dollarization. It dropped the plan in the face of opposition to eliminating a symbol of national identity. In early 1999, President Armando Calderón Sol reiterated interest in official dollarization, after debate on the subject in Argentina brought it into the news. Calderón's successor, Francisco Flores, has indicated interest in preventing future currency

devaluations, and official dollarization remains a topic of active discussion.

In **Costa Rica**, the president of the central bank has expressed interest in official dollarization, and a deputy in the Costa Rican Congress has introduced a bill to abolish the central bank. The finance minister of **Guatemala** has also said that his country is considering adopting dollarization early in the next century (Hernandez 1999).

Mexico. Since its 1994-5 currency crisis, prominent Mexican and foreign figures have debated suggestions that Mexico establish a currency board or dollarize. A number of well-known Mexican businessmen and trade associations have expressed support for dollarization. The presidential candidate of the National Action Party (in Spanish, PAN) has indicated interest in official dollarization and in the somewhat similar currency board system (Tricks 1999).

Other countries. In a number of other countries, including **Brazil, Canada, Hong Kong, Indonesia, Jamaica, Peru, Russia, and Venezuela**, economists and other observers have discussed official dollarization using the U.S. dollar, although government officials have rejected the idea for now. Debate has occurred at high levels, including the Canadian Parliament (Canada 1999a, b; see also Grubel 1999). In Eastern Europe there has been discussion about official dollarization using the euro. At present, interest in official dollarization is not as widespread in those countries as in the Latin American countries just mentioned, but Ecuador's attempt to introduce official dollarization is sure to heighten interest in the subject all around the world.

7. ISSUES IN IMPLEMENTING OFFICIAL DOLLARIZATION

A country considering official dollarization needs to take a number of issues into account. To make the issues clear, this section and the next concentrate on what may seem the most difficult case: rapidly converting a central banking system into an officially dollarized one. Converting a currency board poses far fewer questions because a currency board system already has important similarities to official dollarization.

Are there any preconditions? Some observers have claimed that countries wishing to replace central banking with some other monetary system must fulfill certain preconditions, such as a high level of dollar reserves, a solvent banking system, sound government finances, and flexible wages.

If a country already had the alleged preconditions for dollarization, however, it would not be especially attractive because monetary policy should already be good. Critics neglect that dollarization eliminates the possibility of financing government budget deficits by inflation, and in doing so attacks that problem that is at the root of so many other economic problems in many developing countries. Nor is it necessary to have already in hand all the dollar reserves for official dollarization, provided that the amount that is lacking can be borrowed from financial markets or from a source such as the IMF. The experience of currency board-like systems in Argentina, Bulgaria, and elsewhere confirms that drastic monetary reform itself helps create the conditions for economic success, rather than economic success being a precondition for reform. Official dollarization does not guarantee that a country will implement good economic policies, but in many developing countries it would raise the chance of success.

Which currency will be used? A country can grant legal tender status to more than one currency. Indeed, it can allow people to use any currency they wish for making loans, invoicing sales, paying wages, and so on.

In most cases, though, the economies of scale are such that people will tend to use only one currency, as long as that currency remains relatively good. One can judge what currency that will likely be by observing which foreign currency is already most widely used unofficially. Generally it is the same currency that the central bank targets in its operations in the foreign-exchange market. For countries with currency boards, the likely choice is the foreign currency that already serves as the exchange-rate anchor.

Dollarize unilaterally? Provided it has or can obtain sufficient foreign reserves, a country can dollarize unilaterally, without a formal agreement or even the informal approval of the issuing country. However, there may be economic and political advantages to a more formal arrangement.

Issue coins? Panama and some other officially dollarized countries issue coins. Because coins are a subsidiary part of the money supply, the existence of domestically issued coins has not endangered the credibility of official dollarization in Panama or elsewhere. The main technical reason a country may want to issue coins under official dollarization is that because of their bulk, shipping coins is much costlier than shipping an equivalent value of notes from the issuing country. Minting coins domestically avoids the shipment costs, and, to repeat, may satisfy political desire for a domestic currency as an element of national identity.

Issues related to foreign reserves. A key issue is how much in foreign reserves a country needs to have. Answering this question

involves thinking about several others. Assume that the foreign currency to be used is the U.S. dollar and that the domestic currency is called the peso. Note that these issues do not arise with a currency board because they were resolved when the currency board was established.

What constitutes reserves? As foreign reserves, a central bank typically holds almost no foreign-currency notes, because they pay no interest; instead, it holds foreign-currency deposits at foreign banks and foreign bonds. The central bank in a dollarizing country need not hold actual dollar notes until the time comes to replace peso notes in circulation with dollar notes. To the extent that the central bank holds its existing foreign reserves in forms not suitable for dollarization, such as Japanese yen bonds, it is possible to convert them into dollar reserves provided they are of sufficiently high quality. Almost all foreign reserves of the central bank should meet this description. However, peso bonds may be of such a character that selling them on a large scale over a short period might badly hurt the domestic bond market and the balance sheets of some commercial banks.

What liabilities should be redeemed with reserves? As assets, a typical central bank owns foreign reserves such as foreign-currency bank deposits and U.S. Treasury bonds, and domestic assets such as domestic government bonds. As liabilities, a typical central bank has obligations it has contracted to pay foreign currency; the domestic monetary base; government deposits; and other domestic liabilities, such as its own bonds if it issues them.

At a minimum, official dollarization implies accepting all the peso notes and coins in circulation that the public wants to convert into some form of U.S. dollars. The process may go beyond this to convert not just peso notes and coins, but the other component of the monetary base: the reserves of commercial banks. Where commercial banks are required to hold large reserves that earn no interest, as a way of creating demand for the domestic currency, it is not necessary to convert all peso reserves into dollars. Reserve requirements can be reduced toward zero and most of the required reserves can be converted into government bonds or extinguished.

Typically, peso notes and coins will be converted into dollar notes and coins, but it is also possible to give commercial banks other easily marketable dollar assets, such as U.S. Treasury bonds, if they prefer. Peso bank deposits will become dollar bank deposits; it is not necessary to have sufficient dollar notes and coins on hand to convert every single peso deposit. Commercial banks will hold fractional reserves (reserves of less than 100 percent) against dollar deposits, just as they now do with peso deposits, and just as banks in the United States do with dollar deposits. Provided that the banks start

dollarization with adequate peso reserves, converting part or all of the peso monetary base into some form of the dollar monetary base should give them adequate dollar reserves.

Are existing reserves really usable? Many central banks are not just agents of monetary policy; they are also trustees for dollars owned by other parties. It may seem that the dollar reserves that the central banks have available for official dollarization are correspondingly reduced, but that is not so. All the dollar reserves of the central bank can be available. Because official dollarization eliminates the domestic currency, it also eliminates the need to hold a special pool of foreign reserves. The parties holding dollars at the central bank can instead be given an equivalent amount of government bonds, which will now be payable in dollars and should therefore be more marketable than before.

Exchange rate. Besides depending on what liabilities are redeemed with dollar reserves, the amount of dollar reserves necessary depends on the exchange rate of the dollar with the peso. The exchange rate used to convert pesos into dollars should be neither substantially overvalued nor undervalued compared to the market rate. An overvalued rate will hurt export industries, while an undervalued rate will hurt consumers of imported goods; both extremes are harmful to economic growth.

If dollarization occurs at an exchange rate close to the market rate, banks should not experience sudden demands to convert deposits into dollar notes, any more than they already do to convert peso deposits into peso notes. The market exchange rate and the structure of interest rates will work to balance the gains from holding notes versus deposits. Countries in the 1990s that have established currency board-like systems, which have similarities to dollarization, have found that the systems have encouraged people to bring into domestic banks deposits formerly held abroad and foreign notes formerly hoarded in mattresses. It is therefore implausible to envision that under dollarization, people will want to convert a substantial proportion of bank deposits into dollar notes.

Speed of dollarization. Rapid official dollarization is technically feasible. Countries have made similarly sweeping currency reforms, such as introducing new currencies, almost overnight in many instances. The mechanics of introducing new notes and coins can be accomplished within days or weeks. Dollarization need not take two or three years, as some writers have claimed (Hausmann and Powell 1999). A point in favor of rapid dollarization is that a lengthy period of implementation may raise doubts about the government's commitment to dollarization.

Attitude of the issuing country. A final issue that needs consideration is whether the issuing country offers any help to officially dollarized countries. The U.S. Treasury and the Federal Reserve System have made it clear that they will not rescue domestic banks in officially dollarized countries, nor do they wish to have any role in supervising them. Under the International Monetary Stability Act, though, officially dollarized countries could in effect pledge seigniorage rebated to them by the United States as collateral for loans to strengthen their financial systems. The European Central Bank does not appear to have developed a position on issues related to official "euroization," because discussion so far has focused on countries where the U.S. dollar would predominate.

8. STEPS IN OFFICIAL DOLLARIZATION

A central banking system that wishes to become officially dollarized might do so by taking a series of steps like the following. Steps 4 to 7 are simultaneous. A currency board system can skip to the second part of step 4--declaring the dollar legal tender--because the system already has sufficient foreign reserves for immediate official dollarization and an appropriate exchange rate with the dollar.⁷ Assume still that the foreign currency to be used is the U.S. dollar and that the domestic currency is called the peso.

1. Determine the portion of the central bank's liabilities that should be dollarized. At a minimum this will be peso notes and coins in circulation, and it may include the entire peso monetary base.

2. Assess the financial position of the central bank and the government. The amount of dollars necessary depends on the exchange rate, which will not be known with certainty until step 4 but can be calculated as a range of values. If the central bank already has sufficient net foreign reserves, it can simply sell its foreign reserves for dollars and give people dollars at the fixed exchange rate for the portion of its liabilities that is to be dollarized. As was mentioned, the peso assets of the central bank may be illiquid and not readily convertible into dollars.

If the central bank needs more dollar reserves than it already has, it may still be possible to dollarize immediately by the government borrowing enough dollars to cover the deficit of reserves. The central bank will then cease to exist in its current form and its assets and liabilities will become assets and liabilities of the government.

⁷ For an explanation of the steps necessary for official dollarization in Argentina, which has a currency board-like system, see Hanke and Schuler 1999. On Ecuador, which has central banking, see IEEP 2000.

3. If there are doubts about the appropriate exchange rate for dollarization, allow the peso to float cleanly for a brief, pre-established period. There are three basic types of exchange rates: at one extreme, fixed rates; at the other extreme, floating rates; and in the middle, mixed arrangements that are neither fixed nor floating, including pegged rates, crawling bands, and target zones. A fixed rate is one in which the exchange rate in terms of a foreign "anchor" currency remains constant because appropriate monetary institutions exist to make the rate last. Officially dollarized systems and currency boards have fixed rates. A floating rate is one in which the exchange rate is not maintained constant in terms of any foreign currency. The mixed types are those in which the central bank limits the range of fluctuation in a more or less well defined way for the time being, but cannot guarantee that fluctuations will remain in that range. Historical experience shows that central banks generally cannot maintain truly fixed exchange rates, and that those maintaining mixed types often allow the exchange rate to become overvalued, which creates the conditions for speculative currency attacks and devaluations. If the existing exchange rate is a mixed type that appears overvalued, it may be necessary to let the exchange rate float for a brief period so that it can find an appropriate, market-determined level.

To set an appropriate fixed exchange rate at which to convert peso prices to dollar prices, the best indicator is the market rate that will evolve once people know that the value of the peso will soon be fixed and that the dollar will then replace the peso. Demand for pesos may well increase, in which case the exchange rate will appreciate. The government should not try to manipulate the exchange rate to achieve any particular level; it should let market participants determine the level. Manipulating the exchange rate is costly. A highly overvalued exchange rate will price exports out of world markets and may create a recession, while a highly undervalued exchange rate will make imports expensive and prolong inflation.

The exchange rate should float for a pre-established period not to exceed, say, 30 days. The float should be clean, that is, the central bank should not try to influence the exchange rate.⁸ During the float, the central bank should be forbidden to increase its liabilities unless it obtains foreign reserves equal to 100 percent of the increase. That will prevent the central bank from creating a final burst of inflation. The central bank should publish daily the key items of its balance sheet of

⁸ A clean float implies that the central bank does not engage in sterilized intervention (changing the domestic money supply to offset changes in the foreign-exchange market).

the previous business day, so that its actions are transparent and cause no destabilizing surprises.

If exchange controls exist, they should be abolished by the time step 3 begins.

4. At the end of the period of floating (if one is necessary), declare a fixed exchange rate with the U.S. dollar and announce that effective immediately, the dollar is legal tender. For example, declare that henceforth the exchange rate is 9.5 pesos per U.S. dollar, or some other rate determined to be suitable. The fixed rate should be somewhere within the range of market rates during the period of floating, particularly toward the end of the period of floating. Setting exchange rates is an art rather than a science, and there is no mechanical formula for making the transition from a floating rate to an appropriate fixed rate. If there is doubt about the appropriate rate, it is better to err on the side of an apparent slight undervaluation rather than an overvaluation compared to recent market rates, so as not to cause a slowdown in economic growth. Experience indicates that an economy will quickly adjust to an exchange rate that is approximately right. Again, a large deliberate overvaluation or undervaluation is undesirable because it will require unnecessarily large economic adjustments.

The central bank will then be required to exchange the peso liabilities determined in step 1 for suitable dollar assets—in the case of peso notes and coins, mainly dollar notes and coins; in the case of peso deposits, perhaps U.S. Treasury securities. The dollar will be declared to be “domestic” currency, with all the legal tender rights the peso has. All payments in pesos will be permitted to be made in dollars at the fixed exchange rate.

5. Announce that effective immediately, all peso assets and liabilities (such as bank deposits and bank loans) are dollar assets and liabilities at the fixed exchange rate. Announce a transition period of no more than 90 days for replacing quotations of wages and prices in local currency with quotations in dollars. After the period of floating has ended and the exchange rate has been fixed, bank deposits in pesos will become deposits in dollars, while bank loans in pesos will become loans in dollars. Banks will charge no commission fees for the conversion.

During the transition period, wages can continue to be quoted optionally in pesos so that employers and banks have time to modify their bookkeeping and computer systems. Prices can also continue to be quoted optionally in pesos during the transition period, so as to spare merchants the trouble of repricing the goods on their shelves. After the transition period, wages and prices will cease to be quoted in pesos.

6. Freeze the central bank's total liabilities and dollarize the liabilities determined in step 1. Once the central bank starts redeeming the peso monetary base for dollars, commercial banks should not be allowed to charge commission fees for converting pesos into dollars. Commercial banks will probably want to convert their peso reserves into dollar assets immediately, and that can be done, but exchanging the peso notes and coins in circulation for dollars will be slower. The central bank or the government should continue to accept peso notes and coins for a set period, say one year, though the bulk of exchanges will be made in the first 30 days. After 30 to 90 days, peso notes should cease to be legal tender for hand-to-hand payments.

7. Decide what to do about coins. Given sufficient time, arrangements can be made to have a supply of U.S. coins on hand to replace peso coins when dollarization occurs. If dollarization is begun hastily, though, the supply of U.S. coins may be insufficient. Moreover, the fixed exchange rate may not be one for which coins have a convenient whole-number relationship to the dollar. If so, coins, and only coins, can be devalued or revalued to a nearby whole-number equivalent that makes them decimal divisions of the dollar. As in Panama, local coins can circulate alongside dollar notes. Because in most countries coins are only a tiny portion of the monetary base, the overall effects will be small and the importance of this step will be correspondingly low.

8. Reorganize the components of the central bank as necessary. The central bank will cease to be an institution making monetary policy. Its assets and liabilities can be transferred to the government or to a commercial bank operating as a trustee for the government. Employees working on financial statistics, regulation of financial institutions, economic analysis, and accounting can be transferred to the ministry of finance or the bank supervisory agency. Alternatively, the central bank can be converted into a new independent authority in charge of financial statistics and financial regulation, with its organizational structure largely unchanged.

9. FURTHER TECHNICAL ISSUES IN OFFICIAL DOLLARIZATION

Official dollarization may generate some further technical issues that need to be addressed. Again, assume that the foreign currency to be used is the U.S. dollar and the domestic currency is called the peso.

Inflationary momentum? The only difference between the last day of the peso and the first day of official dollarization is that instead of being quoted in pesos, prices will be quoted in their equivalent

values in dollars. If the dollarizing country was suffering high inflation under the peso, inflationary momentum may persist for a short time after dollarization, but will be self-reversing since the dollar monetary base is outside local control. In countries that are unofficially dollarized, people do not raise prices in dollars just because high inflation makes prices rise in the domestic currency; rather, prices in dollars are stable and prices in domestic currency fluctuate according to changes in the exchange rate.

Business cycles. Official dollarization will link the local business cycle more closely to the business cycle in the United States more closely than a floating exchange rate would. Growth in domestic imports and exports will have some synchronization with growth of the imports and exports of the issuing country because changes in the exchange rate of the dollar against, say, the Japanese yen will have similar effects in the United States and in the dollarized country. However, the dollarized country can grow even when the United States is in recession, and may experience recession even when the United States grows.

Legal issues. Interest rates in dollars are lower and concentrated in a narrower range than domestic-currency rates in most developing countries. If borrowers were paying 50 percent interest a year in high-inflation pesos but are now paying 50 percent a year in low-inflation dollars, that is a huge jump in the real (inflation-adjusted) rate of interest. Fortunately, under official dollarization lenders will be willing to offer lower interest rates because their risk of losing money through inflation will be lower, so opportunities will exist to refinance loans.

Contracts in pesos will become contracts in dollars at the fixed exchange rate established at the end of the period of floating. There will be legal questions involving interest rates, rounding of peso prices to their nearest dollar equivalents, and so on. An efficient way to handle the technical details of dollarization is to do it by decrees, guided by a committee of legal and financial experts. To a large extent, though, businesses should be allowed to make the necessary adjustments as they see fit without having to obey an extensive apparatus of decrees. Though there may be numerous details to be solved, they are minor irritants compared to the relief that official dollarization can bring in many cases.

Soundness of the banking system. Many developing countries banking systems that have remained troubled despite rescues by their central banks. When banks have bad loans, somebody has to bear the cost, no matter what monetary system exists. Often people who hold domestic currency do most of the paying, through inflation that reduces the real value of their assets. Inflation in effect transfers wealth from the general public to bank stockholders and depositors. Official

dollarization eliminates inflation as a way of handling banking crises. Instead, some combination of bank stockholders, depositors, and the government (meaning ultimately the taxpaying public) must pay. Because central banking has no magical ability to make losses disappear, a troubled banking system is no argument for delaying official dollarization.

A previous section described some ways that an officially dollarized country could lend to commercial banks even though it lacks a central bank as a lender of last resort.

Foreign debt. In extreme cases, official dollarization may occur where high inflation and other problems under central banking have led the government and corporations to default on their foreign-currency debt. Dollarization may improve their situation, because the domestic currency may appreciate before it is replaced by the dollar, reducing the burden of foreign debt in terms of domestic currency. However, even if the improvement is not enough to allow the government and corporations to resume payment of the debt, official dollarization can proceed. Officially dollarization prevents a government from printing domestic currency to obtain the resources for paying foreign-currency debt. Instead, the government must obtain resources in noninflationary ways or renegotiate the debt with the lenders. Unlike the typical case with central banking, with official dollarization, a country can have a good currency even without good government finances.

10. THE INTERNATIONAL MONETARY STABILITY ACT

As has been mentioned, the loss of seigniorage from giving up a national currency is a political and economic obstacle to dollarization. To reduce this obstacle, Senator Connie Mack (R-Florida) and Representative Paul Ryan (R-Wisconsin) introduced the International Monetary Stability Act in November 1999.⁹

The International Monetary Stability Act allows the Secretary of the Treasury to certify officially dollarized countries as eligible to receive rebates of seigniorage from the United States. Certified countries would receive rebates of 85 percent of the seigniorage calculated by a formula in the act. The remaining 15 percent would finance rebates to countries that are already officially dollarized (such as Panama), help pay the costs of operating the Federal Reserve

⁹ The Senate bill is S. 1879; the House of Representatives bill is H.R. 3493. The text of the International Monetary Stability Act is available online at <<http://thomas.loc.gov>>. A forthcoming staff report by the Joint Economic Committee will explain the provisions of the act in some detail.

System, and still leave a net increase of revenue for the United States. The amount of seigniorage rebated to certified countries would depend on the level of interest rates in the United States and on the amount of dollar notes and coins in circulation worldwide; the higher either was, the more seigniorage the United States would earn and the more it would rebate.

The act would not pressure any country into official dollarization. Countries would retain complete discretion over the decision to become officially dollarized, and could choose to "de-dollarize" at any time (though if they did, the United States would no longer rebate seigniorage to them). The act does not take a position about whether any country should dollarize. Nor does the act require the Secretary of the Treasury to automatically rebate seigniorage to every country that dollarizes. The Secretary would merely have the discretion to do so, thereby guaranteeing that countries considering official dollarization cooperate with the United States if they desire a rebate of seigniorage.

The act explicitly states that the United States would not be obligated to act as a lender of last resort to countries that officially dollarize, consider their economic or financial conditions when setting monetary policy, or supervise their financial institutions. These provisions ensure that the United States would not become excessively entangled in the economic affairs of certified countries.

The Senate Banking Committee's Subcommittee on Economic Policy and Subcommittee on International Trade and Finance are expected to hold hearings on the International Monetary Stability Act in February.

11. CONCLUSION

In less than a year, official dollarization has changed from an obscure idea to one debated daily in a growing number of countries. Because interest in official dollarization is so recent, basic information about it has been lacking. Although many details remain to be investigated, this report has described the basics of official dollarization in a way that should promote more informed discussion both in the United States and in countries considering official dollarization.

The twentieth century has been a time of increasing currency fragmentation. At the beginning of the century there were far fewer independent countries than exist today, and the great majority of their currencies were linked to silver or gold, in effect dividing the world into two large currency blocs. Currency crises occurred, but were less frequent and severe than they later became. Since the First World War, the number of currencies with independent monetary policies has risen

almost continuously, in tandem with the number of independent countries. The world now appears to have begun a period of currency consolidation that will again divide the world into two or three large currency blocs. The replacement of national currencies with the euro in 11 Western European countries at the start of 1999 has created the first true rival to the dollar in half a century, and has created a sense of urgency in developing countries to try to create their own regional arrangements or to join the dollar or euro blocs.

Official dollarization can be an important option in making the international monetary system more solid and less prone to crises. It has benefits that make it worthy of consideration in developing countries. It also has benefits for the United States, whose realization the United States can promote through the International Monetary Stability Act.

Prepared by Kurt Schuler, Senior Economist to the Chairman. This report originated from research with Zeljko Bogetic of the IMF, whom I thank for many facts and ideas, but it expresses my own views alone.

This staff report expresses the views of the author only. These views do not necessarily reflect those of the Joint Economic Committee, its Chairman, Vice Chairman, or any of its Members.

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- Juan Luis Moreno-Villalaz. <<http://www.sinfo.net/juanluismoreno>>.

Issues Regarding Dollarization

July 1999

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1. INTRODUCTION

On April 22, 1998, the Subcommittee on Economic Policy and the Subcommittee on International Trade and Finance conducted a joint hearing on official dollarization in emerging market countries. Official dollarization means a country eliminates its own currency and adopts the U.S. dollar as legal tender: private parties can use the dollar to settle contracts and the government accepts dollars for debts and taxes and dispenses dollars when making payments. This staff report summarizes the circumstances that have brought attention to this issue, the economics of dollarization, some of the criticisms of dollarization and the replies to those criticisms.

2. BACKGROUND

The financial crises that struck Mexico in 1994-95, a group of Asian countries in 1997, Russia in 1998 and Brazil in 1999 had at least one thing in common: all of the afflicted countries had some version of a pegged exchange rate before the crisis and a floating exchange rate after the crisis.¹ Stabilization programs in emerging market countries based on pegged exchange rates often start off with robust economic growth and a reduction in inflation. Nevertheless, these programs usually end in drastic balance of payments problems, precipitous devaluations and major losses in international reserves.² Meanwhile, in many emerging market countries, floating exchange rates have fostered financial fragility and economic instability, with recessions aggravated

¹ A pegged exchange rate refers to a monetary system in which a country pledges to maintain the value of its currency in terms of a foreign currency -- either at an exact value, within a band, or at a consistently declining rate or range of rates -- but does not establish an automatic mechanism to ensure it has enough foreign currency reserves to repurchase all of the domestic currency in circulation at the pegged exchange rate. A floating exchange rate refers to a monetary system in which a country either pursues monetary policy without any regard for the exchange rate at all (a "pure" float) or sometimes takes the exchange rate into consideration when setting monetary policy but does not do so systematically (a "managed" or "dirty" float).

² Guillermo A. Calvo and Carlos A. Végh, 1999, "Inflation Stabilization and BOP Crises in Developing Countries," National Bureau of Economic Research Working Paper 6925, February; Atish R. Ghosh, Anne-Marie Gulde, Jonathan D. Ostry and Holger C. Wolf, 1997, "Does the Nominal Exchange Rate Regime Matter?," National Bureau of Economic Research Working Paper 5874, January.

by currency depreciations, inflation expectations built into labor markets and domestic interest rates that are both high and volatile.³

Latin American countries are very interested in policies that might contribute to sustained economic stabilization, lower inflation and greater long-term economic growth. Compared to advanced economies, inflation in Latin America has been 100 times as volatile and growth in real gross domestic product twice as volatile -- with recessions that are both more frequent and deeper.⁴

Much of this volatility has been due to unstable policies. Changes in money supply have been 20 times as volatile as in advanced economies, contributing to a history of rapid inflation.⁵ From 1970 to 1998, annual consumer price inflation averaged 158% in Argentina, 143% in Brazil, 51% in Chile, 34% in Mexico, 108% in Peru, and 25% in Venezuela. By contrast, during this same period, inflation averaged 5% in the United States.⁶

The combination of financial problems striking countries with pegged exchange rates, the lackluster record of countries with floating exchange rates and the history of economic instability in Latin America have renewed interest in policies that could improve the long-term macroeconomic environment in that region. The outgoing president of Argentina and the just-departed president of El Salvador have called for official dollarization. Argentine officials are preparing for the potential of dollarization once a new government is installed in

³ Guillermo Calvo, 1999a, "On Dollarization," Draft, April 20, 1999. Eduardo Fernandez-Arias and Ricardo Hausmann, 1999, "International Initiatives to Bring Stability to Financial Integration," Inter-American Development Bank, March. (Paper presented at IADB Conference on New Initiatives to Tackle International Financial Turmoil, Paris, March 14.) Ricardo Hausmann, Michael Gavin, Carmen Pages-Serra and Ernesto Stein, 1999, "Financial Turmoil and the Choice of Exchange Rate Regime," Inter-American Development Bank, March. (Paper presented at IADB Conference on New Initiatives to Tackle International Financial Turmoil, Paris, March 14.)

⁴ Ricardo Hausmann and Michael Gavin, 1996, "Securing Stability and Growth in a Shock Prone Region: The Policy Challenge for Latin America," Inter-American Development Bank, January. (Paper presented at IADB-OECD Conference on Securing Stability and Growth in Latin America: Policy Issues and Prospects for Shock-Prone Economies, Paris, November 9-10, 1995.)

⁵ Hausmann and Gavin, *supra*.

⁶ Remarkably, Argentina's high average inflation includes the low inflation it has experienced since it instituted a currency board system in 1991. "Global Financial Data, World Consumer Prices By Decade," available online at <<http://www.globalfindata.com/tbcpi.htm>>.

December.⁷ Last year, Mexican officials began exploring the idea of taking steps toward some sort of eventual monetary union with the United States.⁸

Official dollarization means a country eliminates its own currency and adopts the U.S. dollar as legal tender. Under dollarization, private parties can use the dollar to settle contracts and the government accepts dollars for debts and taxes and dispenses dollars when making payments. Much of Latin America is already *unofficially* dollarized. By 1995, foreign currency deposits as a share of a broad measure of money supply were 44% in Argentina, 82% in Bolivia, 31% in Costa Rica, 55% in Nicaragua, 64% in Peru and 76% in Uruguay.⁹

Official dollarization has much in common with currency board systems. Under a currency board system, a country fixes the value of the local currency in terms of a hard currency and keeps enough of this hard currency on reserve to fully repurchase all the local currency at the fixed rate. The supply of the local currency *automatically* fluctuates with demand. Local currency may not be issued unless enough of the reserve currency is obtained to repurchase it. When those holding the local currency want to obtain the reserve currency, they may do so on demand, resulting in a contraction in the supply of the local currency. In effect, a currency board system is like a pegged exchange rate, except the country is willing to put its money where its mouth is.

Argentina has had a currency board system since 1991, under which one Argentine peso equals one U.S. dollar.¹⁰ Other places with currency board systems include Bulgaria and Estonia, whose currencies are tied to the euro as well as Hong Kong and Lithuania, whose currencies are tied to the U.S. dollar.¹¹ One way to think of a currency board system is that people use the local currency as if it were vouchers representing ownership shares in the reserve currency, which

⁷ James Wilson, 1999, "Support for Dollarization," *Financial Times* (U.S. Edition), February 17; Jonathan Peterson, 1999, "The Buck Does Not Stop Here," *Los Angeles Times*, April 2; Ken Warn, 1999, "Argentina Edges Forward in its Dollar Project," *Financial Times* (U.S. edition), May 21.

⁸ Jonathan Friedland, 1999, "Mexican Officials Quietly Mull Plan to Link the Peso to the U.S. Dollar," *The Wall Street Journal* (interactive edition), September 28.

⁹ Tomás J.T. Baliño, Adam Bennett and Eduardo Borensztein, 1999, "Monetary Policy in Dollarized Economies," IMF Occasional Paper 171, International Monetary Fund.

¹⁰ Steve H. Hanke and Kurt Schuler, 1999, "A Dollarization Blueprint for Argentina," *Friedberg's Commodity & Currency Comments Experts' Report* (Special Report), Friedberg Commodity Management Inc., February 1.

¹¹ Ghosh, Gulde and Wolf, *supra*.

is stored by the government. For example, if an Argentine buys shoes with 10 pesos, the buyer gives the shoemaker "vouchers" representing ownership of 10 dollars. Under dollarization these vouchers are eliminated and people use dollars directly.

Whether a country dollarizes or uses a currency board system, its domestic monetary policy automatically hinges on monetary policy in the United States, automatically prevents balance of payments crises and prevents the printing of currency to subsidize either government spending or a bailout of the banking system. The key differences are that dollarization renders a country much less capable of devaluing and requires the elimination of the national currency, thereby eliminating the ability to earn seigniorage.¹²

3. ECONOMIC EFFECTS ON EMERGING MARKET COUNTRIES

A growing body of economic research suggests emerging market countries that use currency board systems or that are already dollarized have been more successful than those that use either pegged or floating exchange rates at reducing inflation, increasing economic growth, "deepening" financial markets, increasing fiscal discipline and reducing interest rates and interest rate volatility.¹³

Lower Inflation / Faster Growth. By leaving local policymakers without an easy way to rescind their commitment to the monetary policy of the United States, dollarization would tend to bring inflation down to U.S. levels. Although, in theory, this success against inflation could come at the cost of slower economic growth -- because of tighter credit -- growth has actually tended to be higher in countries with currency board systems than in countries with more flexible exchange

¹² Seigniorage is the profit a country earns from issuing a currency. It's the difference between the cost of issuing a currency and the value of the goods and services the currency can buy.

¹³ Steve H. Hanke, 1999, "Some Thoughts About Currency Boards," In Mario I. Blejer and Marko Skreb (eds.), *Balance of Payments, Exchange Rates and Competitiveness in Transition Economics*, Norwell, Massachusetts: Kluwer Academic Publishers; Kurt Schuler, 1996, *Should Developing Countries Have Central Banks? Monetary Systems and Currency Quality in 155 Countries*, Research Monograph No. 52, London: Institute of Economic Affairs. Ghosh, Gulde and Wolf, supra. Hausmann, Gavin, Pages-Serra and Stein, supra.

rates.¹⁴ The similarity between currency board systems and dollarization should lead to similar results.

"Deeper" Financial Markets. Dollarization may also help countries better insulate themselves from financial contagion and lead to safer, deeper financial markets.¹⁵ Some countries are more vulnerable to financial contagion because the benefits of monitoring their currencies are relatively small, given their small economic size. Hence, investors and lenders lose relatively little when they make negative generalizations about these countries. Dollarization could, in effect, make these smaller economies relatively larger -- as they would become part of an overall dollar-bloc.¹⁶

Second, countries with weak currencies tend to import capital and long-term lending there tends to be done in dollars. This means borrowers with long-term goals must either borrow in dollars and accept exchange-rate risk or borrow short-term in the local currency and accept "maturity mismatches" between their assets and liabilities.¹⁷ Dollarization would eliminate the need for borrowers to make this choice: they could borrow at the appropriate maturity in the currency they use every day. Panama, which is dollarized, is the only Latin American country with a highly liquid and competitive market for 30-year mortgages and domestic interest rates there have been the least sensitive to international financial problems throughout the entire region.¹⁸

Third, with dollarization people would not have to artificially diversify their assets. When an emerging market country with a flexible exchange rate is struck by a negative shock to its economy the people there experience a loss of income. Due to currency depreciation, they also suffer a loss in the value of their domestic-currency savings. This correlation between people's incomes and savings creates an incentive for them to hedge against the risk of an economic shock by

¹⁴ Hanke, 1999, *supra*; Ghosh, Gulde and Wolf, *supra*.

¹⁵ The depth of financial markets may be measured by the ratio of a broad measure of the money supply such as M_2 to gross domestic product (Hausmann, Gavin, Pages-Serra and Stein, *supra*). M_2 includes currency in circulation, bank reserves, travelers checks, checkable and savings deposits, small time deposits and retail money funds.

¹⁶ Calvo, 1999a, *supra*.

¹⁷ For example, a business may invest in a project (an asset) that is intended to show a positive cash flow in ten years, but be unable to borrow (a liability) at a ten-year maturity in the domestic currency, except at exorbitant interest rates.

¹⁸ Fernandez-Aria and Hausmann, *supra*; Hausmann, Gavin, Pages-Serra and Stein, *supra*.

diversifying their assets away from those denominated in the local currency. Dollarization would greatly reduce the need for this hedging strategy.¹⁹

Fiscal Discipline. By limiting the ability of countries to finance government spending by printing money, countries with currency board systems have experienced smaller fiscal deficits than countries with floating or pegged exchange rates.²⁰ By making it even tougher to devalue, dollarization could increase fiscal discipline even more.²¹

Lower, Less Volatile, Interest Rates. Dollarization should reduce interest rates for a variety of reasons. It should almost completely eliminate exchange-rate risk and reduce the inflation premium toward U.S. levels.²² Real interest rates should fall as dollarization should end the practice of diversifying away from local assets and lenders should no longer have to charge a premium for local currency loans to compensate for having their assets and liabilities in different currencies.²³ Interest rates have been shown to be not only lower but less variable in countries with currency board systems or that are dollarized. For example, during the past two years, interest rates have been much less volatile in Argentina and Panama than in Mexico, Peru or Chile.²⁴

4. CRITICISMS AND REPLIES

No Lender of Last Resort. Central banks have historically served as lenders of last resort. When banks have trouble acquiring the funds they need to keep operating -- like during bank panics, when people rush to withdraw their deposits -- central banks stand ready to issue

¹⁹ Hausmann, Gavin, Pages-Serra and Stein, *supra*.

²⁰ Hanke, 1999, *supra*; Ghosh, Gulde and Wolf, *supra*.

²¹ Testimony of Wayne Angell, Chief Economist, Bear, Stearns & Co. Inc., "Hearing on Official Dollarization in Emerging Market Countries," Subcommittee on Economic Policy and Subcommittee on International Trade and Finance of the Senate Committee on Banking, Housing and Urban Affairs, April 22, 1999.

²² Testimony of Guillermo A. Calvo, Director of the Center for International Economics, University of Maryland, "Hearing on Official Dollarization in Emerging Market Countries," Subcommittee on Economic Policy and Subcommittee on International Trade and Finance of the Senate Committee on Banking, Housing and Urban Affairs, April 22, 1999.

²³ Calvo, 1999a, *supra*.

²⁴ Hausmann, Gavin, Pages-Serra and Stein, *supra*.

more currency. Dollarization would render a country's central bank incapable of issuing more currency in response to a banking crisis.²⁵

However, theoretically, because of problems with moral hazard, some countries may be better off without a central bank serving as a lender of last resort (LOLR). By implicitly guaranteeing banks against illiquidity, banks may be more likely to lend for longer periods than they otherwise would, thereby making the banking system more vulnerable. In addition, the mere potential that a central bank might issue extra currency to bailout the banking system may encourage savers to be less cautious in picking the banks to which they entrust their deposits and more likely to withdraw their deposits suddenly when they sense oncoming inflation.

By almost completely eliminating devaluation risk, dollarization may decrease the need for a LOLR. Devaluations increase the effective debt burden on businesses and households that borrow in dollars.²⁶ This often results in greater loan-losses for banks as borrowers struggle to repay. Banks can thereby suffer a decrease in the value of their assets just as the value of their own dollar liabilities rises. Under these conditions, a bank panic becomes more likely.²⁷

The absence of a central bank serving as a LOLR need not render a dollarized country without any LOLR at all. For example, under its currency board system, Argentina has established a "Contingent Repurchase Facility," under which it has an option to sell up to \$6.7 billion in dollar-denominated bonds and mortgages to a group of private international financial institutions in exchange for cash dollars. Dollarization may enable countries to establish such facilities more easily as it would create a wider array of dollar-denominated assets, thereby expanding the pool of potential collateral.²⁸

Another possibility is to have the United States send to dollarizing countries a share of the extra seigniorage it would earn, thereby letting

²⁵ Testimony of Catherine L. Mann, Senior Fellow, Institute for International Economics, "Hearing on Official Dollarization in Emerging Market Countries," Subcommittee on Economic Policy and Subcommittee on International Trade and Finance of the Senate Committee on Banking, Housing and Urban Affairs, April 22, 1999.

²⁶ The effective debt burden rises because these businesses and households often get their earnings in the form of local currency and, after a devaluation, it takes more of the local currency to obtain the amount of dollars they need to repay.

²⁷ Frederic S. Mishkin, 1999a, "International Experiences with Different Monetary Policy Regimes," Working Paper 6965, National Bureau of Economic Research, February.

²⁸ Hausmann, Gavin, Pages-Serra and Stein, *supra*.

countries more easily collateralize Argentina-style emergency lines of credit for their banking systems.²⁹

No Independent Monetary Policy. If an emerging market country dollarized then the monetary policy of the United States would become its own, even if an economic shock to that country warranted a much tighter or much looser monetary policy than the United States has.

In theory, a country can benefit from having its own monetary policy because it can address local economic conditions, thereby cushioning the economy against shocks and smoothing out the long-term trends in economic growth and unemployment. Despite this, many emerging market countries may still be better off without the supposed safety valve of an independent monetary policy. In Latin America, currency depreciations have led to higher interest rates, higher inflation and falling output. Rather than counteracting economic shocks, independent monetary policies have actually been procyclical, exacerbating the ups and downs of the business cycle.³⁰

In theory, a depreciation should lead to cheaper labor and more exports. However, the wage-setting process itself depends, in part, on monetary policy. Emerging market countries exercising their own monetary policies tend to have labor contracts that are shorter and more likely to be indexed to inflation -- workers being aware of the policy environment in which they live. Wages in these countries, therefore, adjust more quickly to looser monetary policies.³¹

A monetary policy aimed at smoothing the business cycle would be expected to have lower interest rates during relatively slow economic times and higher interest rates during relatively fast economic times. But, in Latin America, independent monetary policies have resulted in real interest rates that have been lower when economic growth has been fast than when growth has been slow. This might be because during slow economic times central banks fear that looser monetary policies would cause inflationary spirals due to short-term labor contracts and wage indexation. Hence, when the economy slows,

²⁹ Robert Stein, 1999, "Dollarization: Key Issues," April. (Paper distributed as background material to members and staff of the U.S. Senate Committee on Banking, Housing and Urban Affairs pursuant to a joint hearing on "Dollarization in Emerging-Market Countries" before the Subcommittees on Economic Policy and International Trade and Finance.) Testimony of Guillermo A. Calvo, *supra*. Kurt Schuler, 1999, "Encouraging Official Dollarization in Emerging Markets," Staff Report, Joint Economic Committee (Office of the Chairman), U.S. Congress, April.

³⁰ Hausmann, Gavin, Pages-Serra and Stein, *supra*. Calvo, 1999a, *supra*. Testimony of Guillermo A. Calvo, *supra*.

³¹ Hausmann, Gavin, Pages-Serra and Stein, *supra*.

the central bank loosens less than people expect. In turn, expectations of greater looseness in the future generate interest rates that exceed the level needed to compensate for actual inflation.³²

Currency depreciation due to a looser monetary policy can harm an emerging market country's economy in other ways. First, the value of incomes and savings tend to move in the same direction: when an economic shock causes a drop in income, a currency depreciation will simultaneously reduce the value of domestic savings -- further contracting aggregate demand.³³

Second, a looser monetary policy can raise the cost of intermediate goods that have to be imported, thereby making it tougher to produce final goods and services.³⁴

Third, many businesses and households do much of their long-term borrowing in dollars. In other words, they have a great deal of "liability dollarization." Under these circumstances, a currency depreciation can increase the effective debt burdens on businesses and households, making it more difficult to acquire the dollars they need to pay their lenders. This rise in debt reduces their net worth, contracting their ability to borrow, making banks wary about lending and increasing interest rates.³⁵ Net worth is also reduced by price increases and higher expected inflation, which lead to higher interest rates, higher interest payments and less cash flow.

Reductions in net worth ripple throughout the economy, potentially leading to financial disintermediation, in which banks are unable to fulfill their key economic role of channeling savings to those with good investment ideas.³⁶ With businesses and households having trouble paying their debts, lenders face greater loan-losses, reducing the value of their assets just as their dollar-denominated liabilities increase in value. With bank capital squeezed, banks want to lend less. Banks are also pressured by inflation, as higher interest rates further erode bank capital, resulting in even less lending.³⁷

³² Hausmann, Gavin, Pages-Serra and Stein, *supra*.

³³ Hausmann, Gavin, Pages-Serra and Stein, *supra*.

³⁴ Kenneth Kasa, 1998, "Contractionary Effects of Devaluation," *Federal Reserve Bank of San Francisco Economic Letter* 98-34, November 13.

³⁵ Testimony of Guillermo A. Calvo, *supra*.

³⁶ Frederic S. Mishkin, 1998, "The Dangers of Exchange-Rate Pegging in Emerging-Market Countries," *International Finance* 1:1. Although Mishkin recognizes that any significant currency depreciation may result in financial disintermediation, he believes this argument especially undermines the merit of pegged exchange rate regimes because the devaluations with which these regimes are associated are particularly severe.

³⁷ Mishkin, 1998, *supra*.

Another angle on the merits of having an independent monetary policy is that with dollarization, economic shocks to the United States would be transmitted into the dollarized country.³⁸ However, Latin American economies are already heavily influenced by the business cycle and monetary policy in the United States and flexible exchange rates have not done a good job of insulating them from economic events abroad. Changes in international interest rates have had more of an impact on interest rates in emerging market countries with flexible exchange rates than on interest rates in similar countries with fixed exchange rates.³⁹ In particular, interest rates in Mexico are more responsive than in Argentina, which, in turn, are more responsive than in Panama.⁴⁰

Optimum Currency Area. Related to the issue of the merits of having an independent monetary policy is the issue of the optimum currency area. An optimum currency area is a region in which it is economically preferable to have a single official currency rather than multiple official currencies.⁴¹ For example, all of the states in the United States uses a common currency -- the U.S. dollar. Most likely, not only would the United States as a whole be worse off if any state or group of states had their own currencies, but so would every state individually. Hence, the United States is an optimum currency area, either by itself or, potentially, as part of a larger area.

For a country to dollarize, it must at least implicitly decide that it is part of an optimum currency area with the United States. The availability of adjustment mechanisms -- wage and price flexibility, labor mobility (both geographically and among economic sectors), capital flows and fiscal transfers -- are part of the criteria for determining whether a country fits into this area.⁴² Other criteria include the extent to which the country may be similarly affected by the economic shocks that hit the United States, the general closeness

³⁸ Robert A. Mundell, 1961, "A Theory of Optimum Currency Areas," *American Economic Review*, v. 51, no. 4, September; Mishkin, 1998, *supra*; Mishkin, 1999a, *supra*.

³⁹ Hausmann, Gavin, Pages-Serra and Stein, *supra*.

⁴⁰ Jeffrey A. Frankel, 1999, "Dollarization in Latin America: Solution or Straitjacket?," remarks at the Council of Foreign Relations, Washington, DC, April 6.

⁴¹ Mundell, *supra*; Barry Eichengreen, 1991, "Is Europe an Optimum Currency Area?" National Bureau of Economic Research Working Paper 3579, January; Luca A. Ricci, 1997, "A Model of an Optimum Currency Area," IMF Working Paper 97/76, International Monetary Fund, June.

⁴² Jeffrey A. Frankel and Andrew K. Rose, 1996, "Economic Structure and the Decision to Adopt a Common Currency," revised Draft, May 22; Mundell, *supra*; Ricci, *supra*.

with which the business cycle is synchronized with the United States, the reduction in inflation the country would enjoy by getting monetary policy set by the Federal Reserve, its openness to trade as well as the amount of trade with the United States, the diversification of its economy, and the efficiency gains from eliminating exchange-rate risk and denominating wages and prices in a leading world currency.⁴³

However, a determination that a country does not meet enough of these criteria should not dispose of the issue. Dollarization itself should tend to increase both trade ties between a dollarizing country and the United States as well as the extent to which a country's business cycle is synchronized with the United States. Dollarization itself may also increase the mobility of the factors of production between a dollarizing country and the United States. In turn, increased trade ties and a more synchronized business cycles make a country more likely to fit into an optimum currency area with the United States.⁴⁴

An alternative view is that the determination of whether a country fits into an optimum currency area should not be made based on abstract economic theory but rather by observing the preferences of the people in that country. According to this theory, if people in a country show a preference for holding dollars rather than another currency, then that country is part of an optimum currency area with the United States.⁴⁵

Too Much Pressure on U.S. Monetary Policy. Because a larger share of dollars would be circulating abroad, dollarization could make it tougher for the Federal Reserve to conduct monetary policy. However, Federal Reserve Chairman Alan Greenspan has testified that dollarization would not affect the mechanical ability of the Fed to conduct appropriate monetary policies.⁴⁶ About 55% to 70% of U.S. dollars already circulate abroad, including about 75% of each year's

⁴³ Ronald I. McKinnon, 1963, "Optimum Currency Areas," *American Economic Review*, v. 53, no. 4, September; Peter B. Kenen, 1969, "The Theory of Optimum Currency Areas: An Eclectic View," in *Monetary Problems of the International Economy*, edited by Robert A. Mundell and Alexander K. Swoboda, Chicago: University of Chicago Press; Frankel and Rose, 1996, *supra*; Ricci, *supra*.

⁴⁴ McKinnon, *supra*; Jeffrey A. Frankel and Andrew K. Rose, 1998, "The Endogeneity of the Optimum Currency Area Criteria," *The Economic Journal*, v. 108, July.

⁴⁵ Hanke and Schuler, *supra*.

⁴⁶ Testimony of Alan Greenspan, Chairman, Board of Governors of the Federal Reserve System, "Hearing on Official Dollarization in Emerging Market Countries," Subcommittee on Economic Policy and Subcommittee on International Trade and Finance of the Senate Committee on Banking, Housing and Urban Affairs, April 22, 1999.

new dollar issuance.⁴⁷ Monetary policymakers recognizes this phenomenon and it does not pose any particular problems.⁴⁸

Theoretically, by making other countries more dependent on U.S. monetary policy, dollarization could result in more pressure on the Federal Reserve to conduct policy according to the interests of other countries rather than those of the United States.⁴⁹ However, even without dollarization, emerging market countries -- especially those in Latin America -- are already affected by changes in the stance of U.S. monetary policy.⁵⁰ Chairman Greenspan has testified that the possibility of people in dollarized countries blaming the United States for their problems should not much concern the United States. He does not envision any particular problem with dollarization creating additional pressure on the Federal Reserve to adjust monetary policy to suit other countries' needs.⁵¹

One reason for this is that the economic problems of countries considering dollarization are fluctuations that are many multiples of what the difference is between a loose U.S. monetary policy and a tight U.S. monetary policy, such that all of the policy stances the United States could take within its ordinary range of looseness to tightness would be improvements for them.⁵² In addition, dollarization may actually make countries less sensitive to U.S. economic policy. Changes in international interest rates have had more of an impact on interest rates in emerging market countries with flexible exchange rates than on interest rates in similar countries with fixed exchange rates.⁵³ As noted, previously, interest rates in Mexico are more responsive than in Argentina, which, in turn, are more responsive than in Panama.⁵⁴

Prerequisites. If a country dollarizes it may need to review its banking sector.⁵⁵ If bank supervision is weak and a safety net for banks--either explicit or implicit--encourages excessive risk-taking, the

⁴⁷ Richard D. Porter and Ruth A. Judson, 1996, "The Location of U.S. Currency: How Much is Abroad?" *Federal Reserve Bulletin*, Volume 82, Number 10, October; "Monetary Union in the Americas," 1999, *Economic Research Note*, Morgan Guaranty Trust Company (JP Morgan), Economic Research, February 12.

⁴⁸ Testimony of Alan Greenspan, *supra*.

⁴⁹ Robert Samuelson, 1999, "Dollarization -- A Black Hole," *The Washington Post*, May 12, 1999.

⁵⁰ Calvo, 1999a, *supra*. Hausmann, Gavin, Pages-Serra and Stein, *supra*.

⁵¹ Testimony of Alan Greenspan, *supra*.

⁵² Testimony of Alan Greenspan, *supra*; Hausmann, Gavin, Pages-Serra and Stein, *supra*.

⁵³ Hausmann, Gavin, Pages-Serra and Stein, *supra*.

⁵⁴ Frankel, *supra*.

⁵⁵ Enoch and Gulde, *supra*.

large capital inflow that would accompany dollarization could cause an unsustainable lending boom that ends up contracting bank capital and leads to financial disintermediation. Local banks would simply be unprepared to efficiently channel such large amounts of capital.⁵⁶

The Argentine banking system may already be adequately prepared for dollarization. Argentina has established a deposit insurance system and bank capital regulations that are tighter than those required by international convention. The minimum bank capital requirement is 11.5% of risk-adjusted assets, rather than the 8% level accepted internationally.⁵⁷

Argentina also allows foreign banks to compete freely against domestic financial institutions, thereby letting the country "import" the often higher quality of bank management and supervision in the more advanced economies. By June 1998, foreign banks accounted for 64% of all private bank deposits in Argentina.⁵⁸ Opening-up to foreign banks could be particularly helpful, as local savers could deposit their funds at banks in which they have greater confidence and poor-performance by a bank in the dollarized country could be offset by better performance by the same bank elsewhere in the world.

Seigniorage. Seigniorage is the profit a country earns when it issues a currency. When the Federal Reserve issues dollars it buys U.S. Treasury securities in exchange. So when the Treasury Department makes payments on these securities they go to the Federal Reserve. In turn, the Federal Reserve uses a small portion of these payments to help finance its operations and sends the rest back to the Treasury Department. These payments from the Federal Reserve to the Treasury Department are about \$25 billion per year.⁵⁹

Under its currency board system, Argentina earns seigniorage of about \$750 million per year.⁶⁰ Its method of collecting seigniorage is based on the fact that it doesn't actually have many dollar notes on reserve. Its reserves are in the form of short-term dollar-denominated securities (mostly U.S. Treasuries) on which the Argentines earn

⁵⁶ Mishkin, 1998, *supra*; Mishkin, 1999, *supra*; Frederic S. Mishkin, 1999b, "Lessons from The Asian Crisis," National Bureau of Economic Research Working Paper 7102, May.

⁵⁷ Hanke and Schuler, *supra*.

⁵⁸ Banco Central de la República Argentina, 1998, "Argentina and the Contingent Repo Facility," October; Hausmann, Gavin, Pages-Serra and Stein, *supra*.

⁵⁹ Budget of the United States Government, Fiscal Year 2000, Historical Tables.

⁶⁰ Francois R. Velde and Marcelo Veracierto, 1999, "Dollarization in Argentina," *Chicago Fed Letter*, no. 142, June (Federal Reserve Bank of Chicago).

interest. If Argentina were to dollarize, it would sell these reserve securities for actual U.S. dollars. Argentina would no longer have reserve securities on which to earn interest. Meanwhile, the increased demand for U.S. dollars would allow the Federal Reserve to issue more currency and purchase more securities. In this way, the seigniorage that was previously earned by Argentina would now be earned by the United States.⁶¹

If the United States wants to encourage dollarization, it could arrange to repay some of the extra seigniorage it would earn. Theoretically, this could be a "win-win" situation for both the United States and dollarized countries. The United States would gain by keeping a portion of its increased seigniorage earnings. The dollarized country would gain by getting the presumed overall economic benefits of dollarization and getting to keep most of its seigniorage. In addition, any remittances of seigniorage from the United States could be used to collateralize emergency lines of credit, thereby providing a lender of last resort facility similar to the facility Argentina has now.⁶² The recovery of the seigniorage that would be effectively transferred to the United States is reported to be one of Argentina's primary concerns with dollarization.⁶³

Prepared by Robert Stein, Staff Director, Subcommittee on Economic Policy, U.S. Senate Committee on Banking, Housing and Urban Affairs.

This staff report expresses the views of the author only. These views do not necessarily reflect those of the Subcommittee on Economic Policy, its Chairman, or any of its Members.

⁶¹ Guillermo A. Calvo, 1999b, "Argentina's Dollarization Project: A Primer," unpublished paper, February 18, 1999.

⁶² Stein, *supra*; Calvo, 1999a, *supra*; Calvo, 1999b, *supra*; Schuler, 1999, *supra*.

⁶³ Warn, *supra*.

**Dollarization: A
Guide to the
International
Monetary
Stability Act**

March 2000

**Joint Economic Committee
Staff Report
Office of the Chairman,
Senator Connie Mack**

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1. GENERAL EXPLANATION

The U.S. dollar is the world's dominant currency. About two-thirds of all dollars circulate outside the United States. The dollar is the preferred currency for international trade, central bank currency reserves, and transactions on commodity markets and foreign exchange markets. Many countries in Latin America already use dollars on an unofficial basis. Citizens of other countries often keep deposits in dollars and use dollars for large transactions. Foreign banks often lend in dollars and investors prefer to earn profits in dollars.

In the past few years there has been a great deal of discussion about what the appropriate monetary system should be in emerging market countries. One of the options is official dollarization, whereby a country would eliminate its own currency and adopt the U.S. dollar as legal tender. Ecuador and East Timor have recently enacted legislation to officially dollarize and officials in Argentina and El Salvador have shown a great deal of interest in the idea. Panama has been officially dollarized since 1904.

Why are countries considering dollarization? Supporters of official dollarization say it would reduce inflation and interest rates toward the levels of the United States, increase economic growth by encouraging savings and investment, strengthen financial systems, instill fiscal discipline, and eliminate sudden currency-related economic crises. However, critics claim the loss of an independent monetary policy would be too costly and that a country's banking system must be very strong before official dollarization.

Regardless of how countries weigh the relative merits of these economic arguments, official dollarization faces another obstacle. At present, a country that officially dollarizes must forego the profit it earns from issuing a currency. The currency profit B which economists call seigniorage B is the difference between the value of a currency and the cost of printing it. (For example, a \$100 bill is worth \$100, but only costs several cents to print.) When a country adopts the dollar, it no longer earns currency profit. The currency profit is transferred to the United States. This loss of revenue can be sizeable. For example, Argentina earns about \$750 million per year in currency profit. If Argentina were to officially dollarize, this \$750 million would flow to the United States rather than Argentina. This transfer in currency profit makes official dollarization difficult.

The International Monetary Stability Act (the "IMSA") addresses the issue of currency profit by letting the Treasury Secretary rebate 85% of the transferred currency profit back to the dollarizing country. The remaining 15% would finance rebates to countries that are already officially dollarized (such as Panama), help pay the costs of operating

the Federal Reserve, and still leave a net revenue increase for the United States.

The IMSA would not pressure any country into official dollarization. It simply removes the obstacle posed by the transfer of currency profit to the United States. Foreign countries would retain complete discretion over the decision to officially dollarize. In addition, the Treasury Secretary would not be required to automatically rebate currency profit to every country that officially dollarizes. The Secretary would merely have the discretion to do so, thereby encouraging countries to cooperate with the United States.

In addition, The IMSA makes it clear that the United States would not be obligated to act as a lender of last resort to countries that officially dollarize, consider their economic or financial conditions when setting monetary policy, or supervise their financial institutions. U.S. monetary policy would still be made in the United States.

2. ANSWERS TO FREQUENTLY ASKED QUESTIONS

What does the United States gain from this legislation?

Dollarization abroad would stabilize and expand export markets, thereby helping U.S. workers and businesses. Dollarization would reduce currency risk, thereby helping U.S. investors. It would strengthen foreign economies, thereby reducing the need to use taxpayers' money to bail out countries due to sudden currency-related economic problems.

Why is this legislation important now? There is growing interest in dollarization, especially in Latin America. The IMSA would let other countries know where they stand with respect to the U.S.

Would the IMSA force countries to officially dollarize? No. The decision to officially dollarize would still be each country's to make for itself.

Is official dollarization right for all emerging market countries? This issue is not addressed by the IMSA. The Act merely removes the obstacle of the currency profit transfer to the United States. Countries would still refrain from official dollarization if they didn't think it was in their best interests. In addition, if a country thinks official dollarization is in its best interests but the Treasury Secretary disagrees, the Secretary could refuse to rebate currency profit.

Wouldn't dollarization eliminate the ability of countries to run an independent monetary policy? Yes. Countries that dollarize would adopt U.S. monetary policy as their own. Independent monetary policies in emerging market countries have often tended to aggravate

rather than ease economic problems. Historically, the discretionary use of monetary policy has been a major source of instability in many countries.

Would other countries have a say in U.S. monetary policy? No. The IMSA would not alter the structure of the Federal Reserve or the procedures or goals of U.S. monetary policy.

Wouldn't officially dollarized countries put pressure on the Federal Reserve to conduct monetary policy in their interests regardless of the U.S. economic situation? According to Chairman Alan Greenspan, the Federal Reserve is already under foreign pressure, but this pressure does not lead the Federal Reserve to do things that benefit foreign countries to the detriment of the United States. Greenspan testified that official dollarization would not make the Federal Reserve more readily take such actions. He also noted that all of the monetary policy stances the Federal Reserve takes within its ordinary range of looseness to tightness would be improvements compared to what many countries have now.

Official dollarization would leave countries without a central bank that can serve as a lender of last resort during a banking crisis. Wouldn't this pressure the United States to adopt this role for these countries? First, the IMSA explicitly states that the United States is not obligated to serve as a lender of last resort to officially dollarized countries.

Second, before certifying a country as officially dollarized, the IMSA requires the Treasury Secretary to consider whether a country has opened its banking system to foreign competition or met international banking standards. Either of these would greatly diminish the risk of a bank crisis. The presence of international banks has made Panama's banking system very stable.

Third, a country could establish a lender of last resort facility outside its central bank. For example, Argentina has a \$7 billion emergency line of credit with international banks. Officially dollarized countries can use rebates of currency profit to collateralize such emergency lines of credit. If concerned about a banking system's stability, the Treasury Secretary may hinge certification on establishment of this kind of line of credit.

How would dollarization affect budget deficits in emerging market countries? Dollarization would mean countries could no longer finance government spending by printing money. Like U.S. states, countries that dollarize would be sensitive to how their fiscal policies influence their credit ratings. This would exert downward pressure on spending, thereby reducing budget deficits.

How would official dollarization be implemented? If a country decides to officially dollarize, its central bank would take the assets

that back its currency and convert them into U.S. Treasury securities. It could do this in the financial markets. The central bank would then sell the Treasury securities to the Federal Reserve in exchange for dollars. The country would then use the dollars to repurchase and retire the local currency. In the meantime, the country must cease issuing the local currency and cease accepting local currency for payments (except in exchange for dollars). Dollars would be used for taxes, wages, debts, loans, and bank deposits, just like in the United States.

How would the IMSA effect federal revenue? The Federal Reserve controls the amount of dollars in circulation by selling currency in exchange for U.S. Treasury securities. The Fed then earns interest on the securities. The Fed uses a small portion of the interest to finance its operations and sends the rest back to the Treasury Department.

If a country officially dollarizes, the Federal Reserve would issue more dollars in exchange for more Treasury securities, resulting in more interest ultimately handed back to the Treasury Department. This extra revenue will not occur in the absence of official dollarization. The IMSA would rebate 85% of the extra revenue, thereby still leaving the Treasury Department with an extra currency profit.

By making rebates of currency profit to countries that dollarize isn't the United States, in effect, paying twice for the Treasury securities it acquires from the dollarizing country? No. If a country uses the dollars it gets from the Federal Reserve as its currency, the cost to the United States of sending dollars to the country is merely the cost of printing and issuing the money B which is only a few cents per dollar note. For example, if a country gives the Fed \$15 billion in Treasury securities and the Fed issues the country \$15 billion in dollars, the Fed has made a profit of almost \$15 billion, a profit which will be handed over to the U.S. Treasury. The Act would rebate 85% of the profit.

If the country eventually decides it does not want to use these dollars as its currency, the Fed will have to reduce the amount of dollars in circulation by buying dollars and selling Treasury securities. At that point, the U.S. would no longer earn a profit based on the country's currency use, and the rebates would cease.

3. SECTION-BY-SECTION EXPLANATION

Section 1. Short Title. Section 1 provides that the bill may be cited as the "International Monetary Stability Act of 1999."

Section 2. Findings and Statement of Policy. Section 2 sets out the findings and statement of policy of the Act. The "findings" of the Act state the importance of monetary stability to emerging market

countries, the deficiencies of certain methods of achieving monetary stability, the benefits of official dollarization, and the ability of the United States to encourage official dollarization by offering to share the extra currency profits it would earn with countries that officially dollarize. The "statement of policy" provides that the United States is not obligated to act as a lender of last resort to officially dollarized countries, consider their economic or financial conditions in setting monetary policy, or supervise their financial institutions. It also states that countries are free to officially dollarize unilaterally if they do not want rebates of currency profit from the United States.

Section 3. Certification Section 3 provides the Secretary of the Treasury (the "Secretary") with authority to certify a country as officially dollarized upon the issuance of a written statement explaining why that country has been certified. The Secretary may certify a country as officially dollarized after considering whether it has in fact officially dollarized, opened its banking system to foreign competition or complied with internationally-accepted banking principles, cooperated with the United States on money-laundering and counterfeiting issues, and consulted with the Secretary prior to certification. In addition, the Secretary can consider any other factors he deems relevant.

Section 4. Payments. Section 4 provides that upon certification the Secretary will commence payments to the country every three months. The amount of these payments will depend on the amount of dollars the country purchased from the Federal Reserve in order to officially dollarize (or the dollar value of the local currency in circulation prior to certification, whichever is less), short-term interest rates in the United States, changes in the U.S. price level, using the same inflation-adjustment that is already used to index payments on inflation-indexed Treasury securities. The payments are designed to rebate 85% of the currency profits the country would have earned had it not officially dollarized.

The payments are backed by the full faith of the U.S. Government, and may therefore be paid out of general revenue without being subject to the appropriations process. The Secretary is given the authority to reduce payments to a country if he believes such payments would result in a net revenue loss to the United States.

Section 5. Previously Dollarized Countries. Section 5 provides the circumstances under which countries that were officially dollarized prior to this Act can be certified as officially dollarized and receive payments. Panama, East Timor, the Marshall Islands, Micronesia, Palau, Turks and Caicos, and the British Virgin Islands may not be certified as officially dollarized until 10% of the payments to other countries under this Act equals or exceeds the payments that would be

made to these countries upon their being certified. Payments to previously-dollarized countries will depend on their nominal dollar gross domestic products in 1997, short-term U.S. interest rates and changes in the U.S. price level.

Section 6. Payment Cancellation . Section 6 provides that the Secretary may cease payments to a country if the U.S. declares war on it or if the Secretary issues a written public statement that the country is no longer officially dollarized.

Section 7. Regulations. Section 7 provides that the Secretary and the Federal Reserve System may issue regulations to carry out this Act.

Section 8. Expenses. Section 8 appropriates to the Secretary the necessary expenses to make payments under this Act.

Prepared by the Joint Economic Committee. For more information, please contact Robert Stein.

This staff report expresses the views of the author only. These views do not necessarily reflect those of the Joint Economic Committee, its Chairman, Vice Chairman, or any of its Members.

FURTHER READING

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Social Security in the 21st Century

September 2000

**Joint Economic Committee
Staff Report
Office of the Chairman,
Senator Connie Mack**

SUMMARY

The Original Vision. When Social Security was established in 1935, President Franklin Roosevelt envisioned that the system would be based on sound insurance principles, whereby each generation of workers would contribute sufficient funds to support its own retirement. Changes to Social Security in 1939 abandoned that approach and embraced pay-as-you-go financing, whereby each generation of workers supports the current generation of retirees rather than supporting its own retirement.

Updating Social Security for the 21st Century. Society has changed dramatically since Social Security was designed in the 1930s. The ratio of workers to retirees has fallen greatly, and is continuing to fall, which will make the current pay-as-you-go system unsustainable without major reforms. Other changes since the 1930s that indicate a need to redesign Social Security include the rise in work outside the home by married women and the increasing level of financial investment by average Americans.

The Coming Shortfall. The combination of increased life expectancy and the retirement of the baby-boom generation in coming decades will reduce the number of workers available to support each Social Security beneficiary. Between 2000 and 2030, the number of workers per beneficiary will fall from 3.4 to 2.1. The current Social Security surplus will become a perpetual deficit. Social Security revenues will cover only about three-quarters of promised benefits by 2030. After 2030 the shortfall will grow still more.

Social Security's Low Rate of Return. Even though Social Security is a transfer program rather than a pension system based on income-generating assets, it is useful to compare the rate of return on taxes paid into the system with returns available on private savings. The real (inflation-adjusted) rate of return for new retirees averages about 2 percent a year. In comparison, long-term real rates of return on U.S. equities have averaged more than 7 percent a year.

Is Social Security Fair? Social Security shifts income from some groups in society to others in complex and opaque ways. For example, Social Security's benefit formula is designed to favor low-wage workers. But this feature is often more than offset by the fact that low-wage workers typically have shorter lives than high-wage workers. People with life-shortening diseases, such as diabetes or AIDS, may receive no benefits at all. In fact, recent studies have found that, on average, Social Security may transfer income *from* low-wage workers to high-wage workers.

An Investment-Based Retirement System. Dissatisfaction with Social Security's low rate of return has led many analysts to favor

converting Social Security from a pay-as-you go system into an investment-based system more consistent with the program's original vision. An investment-based system would provide advance funding of future retirement benefits. Without such a change, taxes will have to be increased or promised benefits will have to be cut substantially to keep the system in balance in coming decades. Advance funding provides a prudent way for the nation to avoid imposing financial hardship on our children and grandchildren.

Retirement Savings Accounts (RSAs). Most Congressional plans to reform Social Security with investment-based, advance funding propose to establish personal retirement savings accounts (RSAs) for every worker. With RSAs, individuals and couples would save and invest during their working years to provide for their own future retirement. People would have a legal right to the contributions and earnings in their RSAs, and all Americans would benefit from economic growth and expansion in the nation's financial markets resulting from the additional saving and investment that RSAs would promote.

Advantages of RSAs. Social Security can be either partially or entirely converted from a pay-as-you-go system to an investment-based system with RSAs. Bringing RSAs into the Social Security system would have the following benefits:

- Ensure adequate income for future retirees without imposing large tax increases on future workers.
- Stimulate additional savings and investment to fuel economic growth.
- Increase the incentives to work and earn.
- Reduce the dependency of retirees on a government program always at risk of political manipulation.
- Reduce the hidden and often unfair income transfers in the current system.

Structure of RSAs. RSAs could be designed to have the following desirable features:

- RSAs should recognize the joint nature of earnings within marriage. In case of divorce, a couple's RSAs should be equally divided. That would provide security for the lower-earning spouse.
- The fraction of earnings allocated to RSAs could be larger for lower-income workers. Such a "progressive contribution" structure would raise retirement income for the elderly poor, and would treat the poor more favorably than the current system.
- Individuals could be permitted to diversify their portfolios with holdings of bonds, equities in broad-based funds such as index

funds, and money market funds. Over periods of 20 years or more (the relevant spans for retirement investments), broad-based equity funds have little risk of underperforming bonds or returns on Social Security taxes. In fact, equities have historically provided rates of return approximately $3\frac{1}{2}$ times the current rate of return on Social Security taxes.

- RSAs could be structured to keep administrative costs low. A simple structure for RSAs could hold administrative costs below 0.4 percent of assets per year—a level achieved by many mutual funds.

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FOREWORD

Social Security is a vitally important program that touches the lives of nearly all Americans. In the near future, the baby-boom generation will retire and the population of elderly people will expand greatly. We need to plan for those changes now by establishing a sound system that will enhance the retirement security of future generations of Americans.

As this report highlights, Social Security was designed during an era when Americans typically had larger families, shorter life spans, and fewer years of retirement. Today, the economy and demographics of the United States are much different. There are fewer workers supporting each Social Security beneficiary, a trend that will continue in the decades to come. Unless the "pay-as-you-go" structure of Social Security is modified, big tax increases or substantial cuts in promised benefits will eventually be necessary.

We need to find a way to fix the finances of the system while continuing to ensure good levels of retirement income for all Americans. Many people are coming to the conclusion that the best way to accomplish these goals is by establishing personal retirement savings accounts for all workers. Retirement savings accounts would provide a secure source of retirement income, while allowing everyone to benefit from the growth of the economy. Additionally, broad-based ownership of the financial assets in such accounts would provide many other benefits. For example, should a worker or retiree pass away, the funds in his or her retirement savings account would remain as an inheritance available to support family members.

Modernizing Social Security will be one of the most important issues confronting the new President and the new Congress. All Americans have a stake in this issue. I believe that policymakers and the general public alike will find this report helpful as we work together to improve the nation's retirement system.

**Senator Connie Mack, Chairman
Joint Economic Committee**

I. INTRODUCTION

The Old Age, Survivors, and Disability Insurance (OASDI) program, popularly known as Social Security, was established in 1935. The system is financed by a flat-rate tax on wages up to a cut-off level. Currently, the tax rate is 12.4 percent (10.6 percent to finance benefits to retirees and surviving dependents, and 1.8 percent to finance benefits to disabled persons). The income cut-off, currently \$76,200 a year, is adjusted upward each year by the growth rate of nominal wages.⁶⁴ The formula used to determine retirement benefits is, on its face, highly progressive: persons with low lifetime earnings gain relatively larger benefits.

Social Security is currently running a surplus, but it faces a troublesome financial future. As members of the baby-boom generation start reaching age 65 beginning in 2011, the number of workers per Social Security beneficiary will steadily decline, transforming Social Security's surplus into a deficit. Sustaining the program in its current form will then require raising taxes or reducing promised benefits, neither of which is an attractive option. Thus, Americans are considering other ways to bridge the gap, particularly the use of retirement savings accounts (RSAs). This report focuses on the nature of Social Security's funding problem and analyzes the potential of RSAs to enhance the retirement security of Americans.

President Franklin Roosevelt signed the Social Security Act into law in August 1935. The new program promised a secure pension to all participating retirees age 65 and over. The first payments, averaging \$18 a month (equivalent to about \$220 in today's dollars), were made in 1940 to 220,000 beneficiaries. Benefits were financed by a 2 percent payroll tax (1 percent on the employer and 1 percent on the employee⁶⁵) levied on the first \$3,000 of earnings (equivalent to about \$37,000 in today's dollars). Through the years, the number of beneficiaries and the level of average benefits have increased dramatically, pushing the tax rate and the earnings cut-off higher and higher. Today, Social Security is by far the largest federal program, accounting for 23 percent of all federal spending—more than spending on defense or all non-defense discretionary programs combined.

When Social Security was established, it was thought that workers would contribute to a pool of national savings that would be available to pay their future retirement benefits. President Roosevelt, for

⁶⁴Medicare is financed by a separate, additional payroll tax of 2.9 percent. Unlike the Social Security tax, it has no income cut-off.

⁶⁵Ultimately, it is employees who pay for the tax on the employer, in the form of lower after-tax wages or lower demand for employees.

example, perceived the new system to be founded on sound insurance or private pension principles, as illustrated by some of his statements on Social Security:

- “Get these facts straight. The Act provides for two kinds of insurance for the worker. For that insurance both the employer and worker pay premiums—just as you pay premiums on any other insurance policy.”⁶⁶
- “We put those payroll contributions there so as to give the contributors a legal, moral, and political right to collect their pensions...”⁶⁷
- “In effect, we have set up a savings account for the old-age of the worker.”⁶⁸

Unfortunately, the Social Security system never lived up to Roosevelt’s vision of an advance-funded pension plan providing workers with a secure right to their retirement benefits. Even though many people describe Social Security as a type of insurance program, the Supreme Court has twice ruled that, unlike the case with private insurance, paying into the system gives individuals no legal right to benefits.⁶⁹ Moreover, the Social Security system never developed a true pool of savings that would be available for advance funding of future benefits. Under legislation adopted in 1939, Social Security was placed on a “pay-as-you-go” basis, and this structure has been maintained ever since.⁷⁰

Debates from the 1930s regarding the merits of pay-as-you-go versus advance-funded retirement systems are being replayed in today’s discussions of Social Security reform. Under an advance-funded, investment-based system, funds paid in during working years are invested in stocks, bonds, and other assets. The funds increase with returns provided by economic growth and are available to finance retirement benefits in the future. In contrast, under the current pay-as-you-go system, payroll tax revenues flowing into Social Security are almost immediately paid out to current beneficiaries or used for other government programs. There is no saving or investment in real assets to pay future benefits. As explained in more detail later, the Social Security Trust Fund is just a bookkeeping entry. The federal government is not using the Social Security system’s current surpluses to accumulate assets and provide advance funding for future deficits.

⁶⁶Ferrara and Tanner (1998), p. 23.

⁶⁷Ferrara and Tanner (1998), p. 23.

⁶⁸Ferrara and Tanner (1998), p. 37.

⁶⁹The rulings came in the 1937 *Helvering v. Davis* case and the 1960 *Flemming v. Nestor* case.

⁷⁰Schieber and Shoven (1999), p. 82.

It is essential, then, to examine cash flows into and out of the Social Security system rather than the account balance of the Trust Fund. The cash flows depend on economic and demographic factors that are continuing to evolve and change the financing of Social Security.

II. OUR CHANGING WORLD: THE 1930s VERSUS TODAY

When Social Security was established, the U.S. population was growing rapidly, families were large, relatively few Americans lived much past age 65, married women generally did not work outside the home, and the divorce rate was low. All of these factors influenced the design of the Social Security system. Today the world is much different. The differences must be considered as we think about adapting the nation's retirement system to the realities of the 21st century.

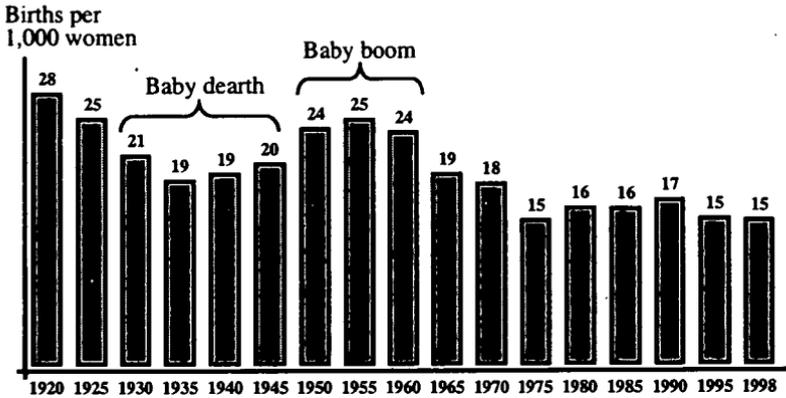
A. A Slower-Growing Population

During the first three decades of the 20th century, the population of the United States increased at an average annual rate of 1.6 percent. In contrast, the population has grown at an average annual rate of only 1 percent during the last three decades. As Exhibit 1 shows, the birth rate fell during the "baby-dearth" years of the Great Depression and the Second World War (1930 to 1945). After rising during the baby-boom era (1946 to 1960), the birth rate has once again fallen sharply during the last four decades. Women of childbearing age now have only about half as many children as their counterparts of the early 1920s. Today, the birth rate is lower and the average family size is smaller than at any time since Social Security was established.

The fall in the birth rate has dramatically altered the relative size of successive generations during the last seven decades. In 1930, the elderly (those age 65 and over) comprised only 5.4 percent of the population. People under 25 represented 47.5 percent of the total, or nine times the number of the elderly. Exhibit 2 shows that the structure of the population in 1930 was like a pyramid. Today, the elderly comprise 12.7 percent of the population, more than twice the share of 1930. People under age 25 account for 35.3 percent of the total, or fewer than three times the number of the elderly. By 2030, people under 25 are projected to comprise 32.8 percent of the population, only a little more than one and a half times the number of the elderly, who

Exhibit 1: Fluctuations in the U.S. Birth Rate, 1920 to 1998

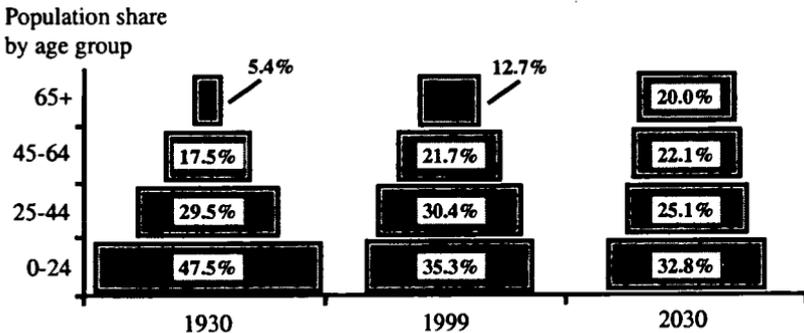
The birth rate was high in the 1920s, before Social Security began. It fell substantially in the baby-dearth era (1930 to 1945), before rising during the postwar baby-boom era (1946 to 1960). Since the early 1960s, the birth rate has fallen and is now much lower than in earlier periods. Social Security will be strained as the baby-boomers begin reaching age 65 in 2011.



Source: Centers for Disease Control, National Center for Health Statistics, 2000.

Exhibit 2: Changes in the Age Composition of the U.S. Population

Falling birth rates and rising life expectancy have changed the age composition of the U.S. population. In contrast with 1930, younger age groups are now only slightly larger than their older counterparts. This makes pay-as-you-go Social Security less sustainable.



Sources: Bureau of the Census via Haver Analytics.

will comprise 20 percent of the total. The structure of the population will be more like a rectangle than a pyramid.

The age structure of the population when Social Security was established was highly favorable for a pay-as-you-go retirement system. Each generation was substantially larger than its predecessor, making it relatively easy for workers to support the previous generation of retirees. These positive demographics will reverse in the coming decades, making the pay-as-you-go approach much less viable.⁷¹

B. Longer Life Expectancy

Life expectancy at birth for Americans has risen from less than 64 years in 1935 to 77 years today. Since most people begin full-time work at about age 20, life expectancy at 20 provides insight on the average number of years people spend working relative to the average number of years in retirement. In 1930, the average 20 year-old man was not expected to live to the normal retirement age of 65, while the average 20 year-old woman could expect to live just 5.4 years beyond age 65. By 1997, the average 20 year-old man could expect to live 9.7 years beyond 65, while the average 20 year-old woman could expect to live 15.2 years beyond 65. Frame A of Exhibit 3 shows how life expectancy at age 20 has increased since 1930.

With regard to Social Security, the additional years of life that can be expected at age 65 is also an important statistic. As Frame B of Exhibit 3 indicates, men age 65 were projected to live another 12.1 years in 1930 and another 15.9 years in 1997—an increase of 31 percent. For women, life expectancy at 65 rose from 13.6 years in 1930 to 19.2 years by 1997—an increase of 41 percent. Thus, the average Social Security recipient now receives retirement benefits longer than was the case when the system was instituted.

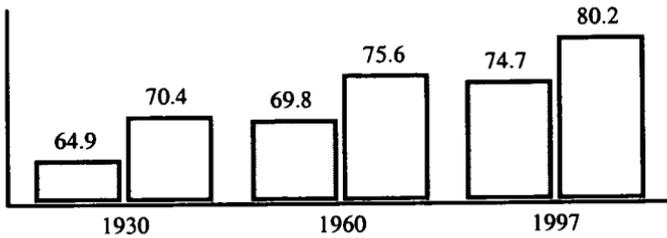
The Social Security Administration projects that life expectancy at age 65 will increase just two more years by 2040. The projection, though consistent with the experience of past decades, may be low. As

⁷¹In 1967, the future Nobel Prize-winning economist Paul Samuelson wrote, "The beauty of social insurance is that it is actuarially unsound. Everyone who reaches retirement age is given benefit privileges that far exceed anything he has paid in....How is it possible? It stems from the fact that the national product is growing at compound interest and can be expected to do so for as far as the eye cannot see. Always there are more youths than old folks in a growing population." Samuelson and other observers did not foresee that birth rates would decline and life expectancy would increase so much as to undermine the actuarial basis of social insurance in the United States and elsewhere.

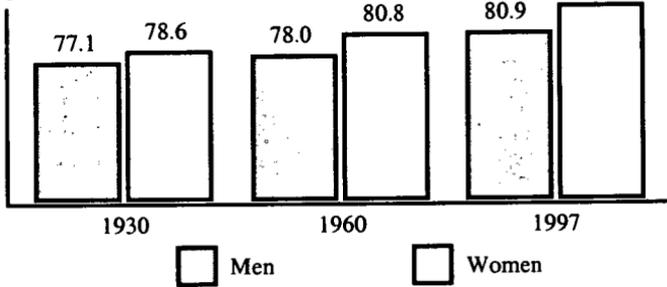
Exhibit 3: Increases in Life Expectancy

Life expectancy for men and women age 20 has increased dramatically since the inception of Social Security (Frame A). Men and women are now expected to live longer beyond the normal retirement age of 65, thus drawing Social Security for more years (Frame B).

Total life expectancy at age 20 (years) Frame A



Total life expectancy at age 65 (years) Frame B



Source: Centers for Disease Control, National Center for Health Statistics, *Health, United States, 1999*.

we move into the 21st century, many scientists believe new drugs and medical breakthroughs from decoding the human genome will lead to a dramatic increase in the number of elderly Americans. Longer life spans reduce the sustainability of pay-as-you-go programs like Social Security in its current form.

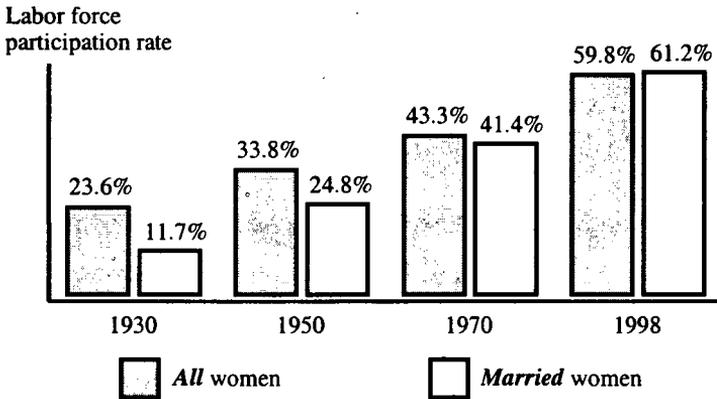
C. More Married Women Working Outside the Home

In the 1930s, the typical American family had a husband earning wages and a wife working at home and caring for children. As Exhibit 4 shows, only 11.7 percent of married women participated in the labor force in 1930. Today, 61.2 percent of married women work outside the home.

The design of Social Security reflects the typical division of labor within families when the program began. The spousal benefits provision of Social Security permits a spouse to draw benefits based on his or her own earnings or 50 percent of the benefits earned by the

Exhibit 4: The Rising Labor Force Participation Rate of Married Women

When Social Security was established in the 1930s, few women, particularly married women, were in the labor force. This factor was the rationale for the system's spousal benefit. Today, the labor force participation rate of married women is at parity with that of other women and is more than five times the level of 1930.



Sources: *Statistical History of the United States from Colonial Times to the Present*, series A 160-171 and D 29-41; U.S. Census Bureau, *Statistical Abstract of the U.S. 1999*, tables 650, 657; Haver Analytics.

other spouse, whichever is greater. Additionally, if the higher-earning spouse dies, the surviving spouse receives 100 percent of the higher-earning spouse's benefits, rather than the 50 percent spousal benefit. These provisions benefit women who do not work outside of the home, the typical situation in the 1930s. Today, however, most married women spend many years working for wages, but they often derive little or no additional benefit from the Social Security taxes they pay because they could receive benefits almost as great without earning wages.

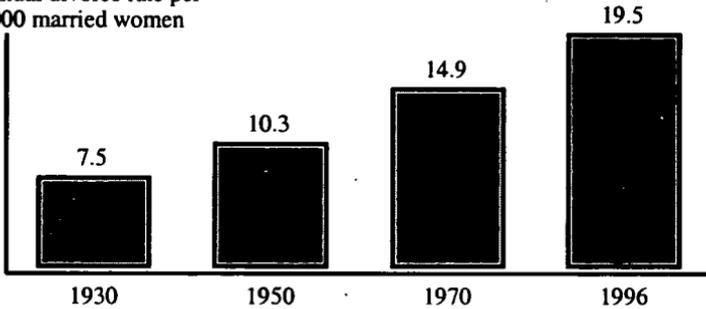
D. A Higher Divorce Rate

In the 1930s divorce was less common, so Social Security's rules about benefits in the case of divorce affected fewer people. As Exhibit 5 illustrates, the divorce rate has almost tripled since 1930, hence rules about the impact of divorce and remarriage on benefits are now quite important. Under current law, a divorced person who has not remarried is eligible for spousal benefits from a marriage lasting at least ten years. However, eligibility ends if the person remarries, and no benefits are paid from marriages lasting less than ten years. These rules can interfere with decisions to remarry and are unfair to many Americans.

Exhibit 5: The Divorce Rate and Social Security

Social Security benefits may be drawn on the basis of a spouse's earnings, but only when a marriage lasts 10 years or more. The divorce rate today is nearly three times the level of the 1930s, subjecting an increasing number of Americans to this arbitrary treatment.

Annual divorce rate per
1,000 married women



Sources: *Statistical History of the United States from Colonial Times to the Present*, series B 216-220; U.S. Census Bureau, *Statistical Abstract of the United States*, 1998, p. 133, no. 156.

E. Earlier Retirement

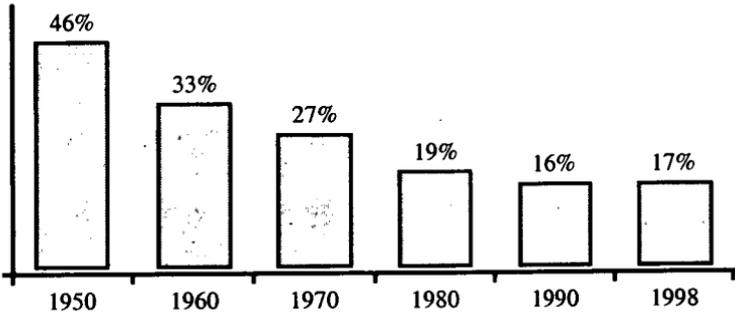
Americans, especially men, are now retiring earlier than they did during the initial years of Social Security. As Exhibit 6 indicates, the share of men 65 and over who were working fell from 45.8 percent in 1950 to just 16.5 percent by 1998. Men 60 to 64 are also working less: 63.7 percent were working in 1976, but only 54.8 percent in 1999. The decline in the proportion of elderly men working reduces the ratio of workers per Social Security beneficiary.

The downward trend in labor participation of those over age 60 reflects both improvement in the financial status of the elderly and the structure of the Social Security system. Many people over age 60 retire because they are financially secure and do not want to continue working. However, others retire because the rules of the Social Security system discourage them from continuing to work. Until earlier this year, Social Security recipients over the normal retirement age (currently 65, but rising to 67 by 2022) faced an "earnings test" that reduced their benefits by \$1 for every \$3 earned above a modest income level. In essence, the earnings test imposed an extremely high marginal tax rate on the elderly. Social Security recipients over the normal retirement age got to keep only about \$40 of every \$100 they earned above the cutoff; \$60 went to the tax collector. The high tax rate discouraged work. Now that Congress has repealed the earnings test for people over the normal retirement age, it will be easier for them to

Exhibit 6: The Labor Force Participation Rate of Elderly Men, 1950 to 1998

Labor force participation by men over 65 fell almost two-thirds from 1950 to 1998. Higher incomes and the high marginal tax rates accompanying the Social Security earnings test both contributed to the decline. Congress recently repealed the earnings test for those 65 and older.

Labor force participation rate of men over age 65



Source: Bureau of Labor Statistics, *Monthly Labor Review*, December 1999.

improve their quality of life by working a little more as they phase into full retirement.⁷²

F. More Equity Ownership

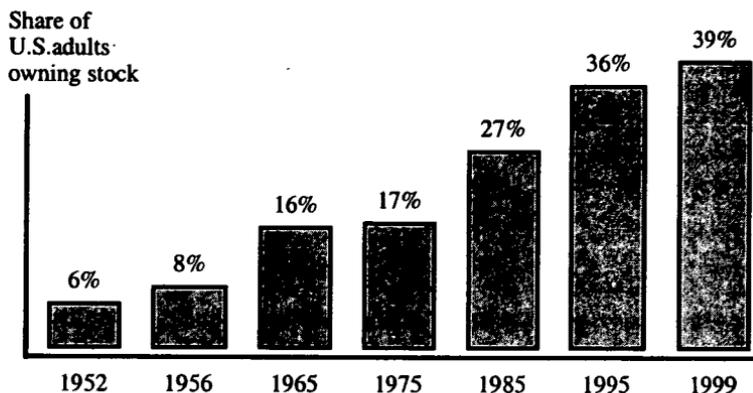
When President Roosevelt signed Social Security into law, most of the elderly derived economic security from continued work or family support, rather than from substantial holdings of financial assets. Estimates indicate that only about 5 percent of adults at the time held equities (stocks). Social Security was revolutionary in that it created a reasonably secure stream of retirement income for millions of Americans.

Since then, however, Americans have vastly expanded their holdings of financial securities. Individual Retirement Accounts (IRAs), 401(k) plans, mutual funds, and reductions in brokerage fees have greatly enhanced the ability of ordinary Americans to plan for their own retirement. Through individual stock ownership and broad participation in retirement plans, 79 million Americans now own equities.

⁷²The earning test remains for those age 62 to 64. Their Social Security benefits are reduced by \$1 for every \$2 they earn above the earnings cut-off. When the income and payroll taxes are considered along with the benefit reduction, these workers face an implicit marginal tax rate of approximately 75 percent for earnings above the cut-off.

Exhibit 7: Share of U.S. Adults Owning Equities, 1952 to 1999

There has been a dramatic increase in the share of the adult population owning equities since the early 1950s. Today, 39 percent of all adults (and 48 percent of all households) own equities, either directly or through pensions or mutual funds.



Source: New York Stock Exchange (2000).

Exhibit 7 plots the rise in individual ownership of equities. In 1952, the first year of accurate statistics tabulated by the New York Stock Exchange, only 6 percent of adult Americans owned stocks. By 1975 the figure had risen to 17 percent; in 1985 it reached 27 percent; and by 1999 it was 39 percent. Stock ownership by *households* is even greater: in 1983, just 19 percent of U.S. households owned stock, but by 1999, the number had risen to 48 percent. While some view increased reliance on stock ownership as “risky,” the vast majority of investors are planning for the long term. One survey found that 87 percent of investors follow a buy-and-hold strategy, and 66 percent view their investments primarily as retirement security.⁷³

III. SOCIAL SECURITY'S COMING SHORTFALL

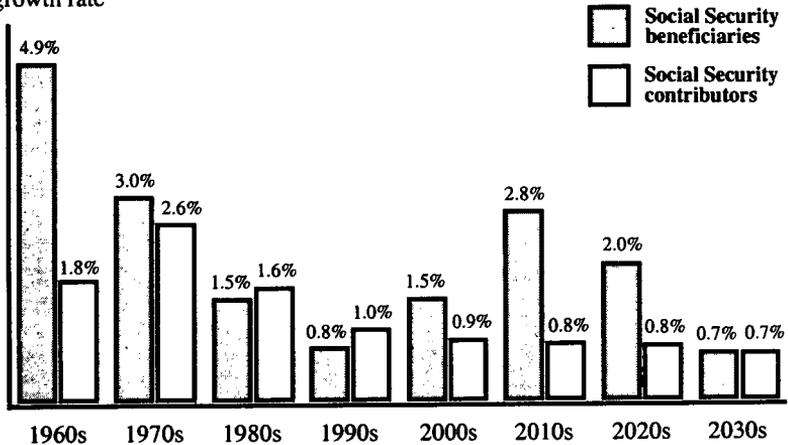
The flow of funds into and out of a pay-as-you-go retirement system is sensitive to demographic conditions. The Social Security system is currently enjoying a period of favorable demographics. Although the U.S. birth rate was low during the first decade of Social Security, a baby-boom era followed from 1946 to 1960. The baby-boomers are now in their prime earning years, which has boosted payroll tax revenues. The Great Depression/Second World War group

⁷³Equity Ownership in America, Fall 1999.

**Exhibit 8: The Decade-by-Decade Growth Rates
of Social Security Contributors and Beneficiaries**

In the 1980s and 1990s, the number of Social Security contributors grew slightly faster than the number of beneficiaries. As the baby-boomers retire during the next three decades, the number of beneficiaries will grow substantially faster than the number of contributors.

Average annual
growth rate



Source: Social Security Administration (1999).

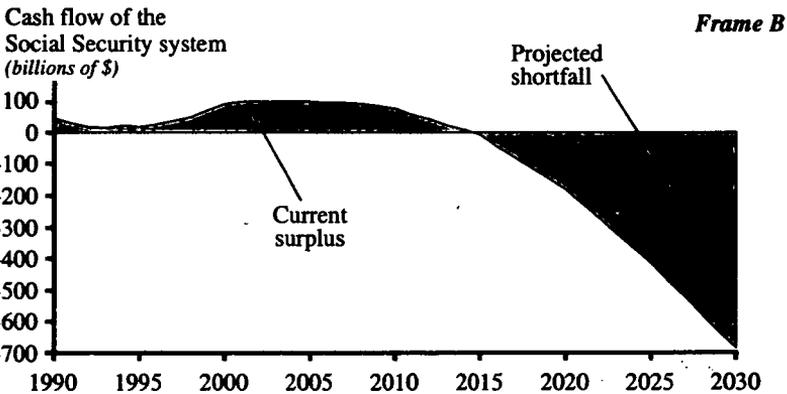
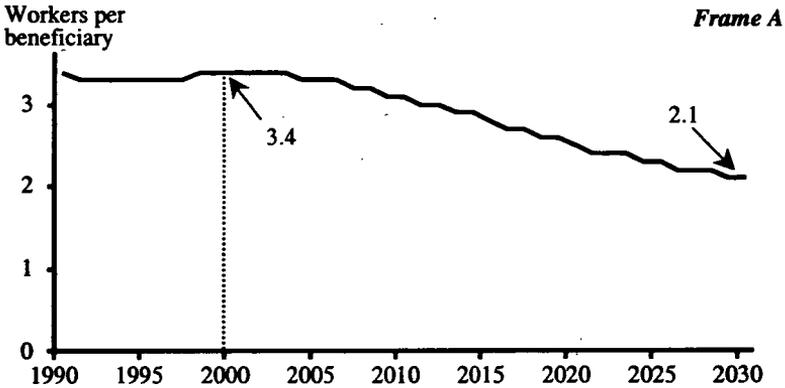
is now retiring and because it is a relatively small generation, payments to it are also relatively small.

The demographics will change dramatically in the coming decades. The baby-boomers will begin reaching the normal retirement age of 65 starting in 2011. Their retirement, combined with rising life expectancies, will substantially increase the number of retirees relative to the number of workers, as shown in Exhibit 8 and Frame A of Exhibit 9. There are currently 3.4 workers per Social Security beneficiary, a figure that has remained relatively constant over the last three decades. In a few years the ratio will start falling, and by 2030 there will be only 2.1 workers per beneficiary. After that the ratio will continue falling, though at a slower rate.

The surpluses that Social Security is currently experiencing flow into the Social Security Trust Fund. The Trust Fund uses the revenue to buy special nonmarketable bonds from the U.S. Treasury. These bonds

Exhibit 9: The Falling Worker-to-Beneficiary Ratio and Coming Shortfall

As Frame A illustrates, the worker-to-beneficiary ratio will decline from 3.4 today to 3.1 in 2010 and then plummet to 2.1 by 2030. As a result, the Social Security surplus will be transformed into a deficit around 2015. As Frame B shows, this shortfall is projected to explode in the years that follow.



Sources: *Social Security Bulletin, Annual Statistical Supplement, 1999*, table 4.A3; *2000 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds*, table III.B.3; data on workers per beneficiary come from the Social Security Administration Web site, <http://www.ssa.gov/OACT/STATS>.

Note: OASDI receipts exclude interest income, miscellaneous payments from the general fund of the Treasury, and income from taxation of Social Security benefits.

are not an accumulation of assets that the government could later sell, like a trust fund in the usual sense. Rather, they are merely an IOU from one part of the U.S. government (the Treasury) to another (the Social Security Administration). Their net value to the federal government is zero! To redeem the bonds in the Social Security Trust Fund, the federal government will have to raise taxes or increase

borrowing, which is precisely what it would have to do if no Trust Fund existed.⁷⁴

According to estimates by Social Security's actuaries, the fall in the number of workers per Social Security beneficiary will cause the current Social Security surplus to disappear and become a large cash-flow deficit beginning in 2015. As the baby-boomers retire, the deficit will grow. Frame B of Exhibit 9 shows how quickly the deficit will grow. Under current law, revenues will be sufficient to pay only about three-quarters of promised benefits by 2030, and less in later years.

Nor will robust economic growth by itself cure Social Security's financial problems. Retirement benefits are indexed to average growth in nominal wages. If higher productivity enables *real* (inflation-adjusted) wages to rise quickly, so will Social Security benefits. For example, if inflation is zero and real wages grow 2 percent a year instead of their previous level of 1 percent, the formula used for calculating the Social Security benefits of people retiring that year will also grow 2 percent instead of 1 percent. Higher economic growth may temporarily improve Social Security's finances, but under current law the improvement will not last.⁷⁵

IV. THE REAL RATE OF RETURN ON SOCIAL SECURITY TAXES

It is common to calculate a rate of return on financial investments by comparing initial investments with the stream of projected future income (or benefits). A rate of return calculation can be performed for Social Security by comparing the payroll taxes a worker pays with the future benefits he or she is promised. Social Security is unlike a regular financial investment since there is no accumulation of assets and no legal right to benefits. Nonetheless, it is useful to make rate of return calculations for Social Security because they show what workers would be able to do with their payroll taxes if they could redirect them

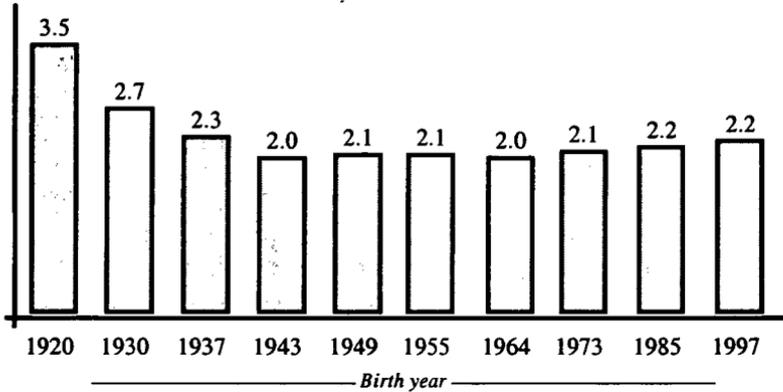
⁷⁴As Dan Crippen (2000), director of the Congressional Budget Office, has explained, "These [Social Security trust fund] balances are available to finance future benefit payments and other trust fund expenditures, but only in a bookkeeping sense. These funds are not set up to be pension funds, like the funds of private pension plans. They do not consist of real economic assets that can be drawn down in the future to fund benefits. Instead, they are claims on the Treasury that, when redeemed, will have to be financed by raising taxes, borrowing from the public, or reducing benefits or other expenditures. The existence of large trust fund balances, therefore, does not, by itself, have any impact on the Government's ability to pay benefits."

⁷⁵Davis (2000).

Exhibit 10: Declining Real Returns on Taxes Paid into Social Security

Real rates of return on taxes paid into Social Security have stabilized around 2 percent. This assumes no changes in payroll taxes or promised benefits. The current payroll tax is sufficient to finance only 72 percent of promised benefits, so the figures below are overstated.

Real annual projected
rate of return on Social
Security contributions* (%)



Source: Social Security Advisory Council (1997).

Note: *Rates of return are for two-earner married couples, each partner with a moderate income. Data for single males, single females, and married one-earner families follow the same general downward trending pattern. Due to the spousal benefit, returns for single-earner families are modestly higher.

to retirement savings accounts. Exhibit 10 shows real rates of return by birth year.

With a pay-as-you-go system, there is no accumulation of assets that will generate a future stream of earnings that can be utilized to pay benefits. This highlights two important points. First, pay-as-you-go Social Security is like a chain letter scheme. Its rate of return depends on the number of workers paying into the system and the real growth of their earnings.⁷⁶ If the growth of the earnings tax base slows, so will the rate of return. Second, there is no stock of capital generating a return. Thus, the rate of return of a pay-as-you-go system will almost invariably be less than that of a system based on capital formation. Furthermore, compared to an investment-based system, the taxes and transfers of the pay-as-you-go structure reduce investment and thereby retard economic growth.

During the early years of Social Security, rates of return were very high. The system was able to pay generous benefits because there were many workers per beneficiary. The era of high returns is now over. The

⁷⁶In the long run, the average rate of return of a pay-as-you-go Social Security system will be equal to the real growth rate of the underlying earnings tax base, which depends on the growth in the number of workers and the growth in average real wage rate. See Samuelson (1958).

program has matured and the number of workers per beneficiary has declined. Payroll taxes have risen greatly over the decades and without reform to the system, more tax increases will be necessary merely to fund currently promised benefits.

The rates of return in Exhibit 10 assume that the current tax rate and promised benefits are maintained. The estimated average real rate of return for persons born in 1937, a group now approaching normal retirement age, is 2.3 percent. For persons born in 1943 and later, the estimated real rate of return hovers slightly above 2 percent a year. However, as we noted, the revenues derived from the current tax level are projected to cover only about three-quarters of promised benefits by 2030. Without reform to the system, taxes will have to be increased or benefits will have to be cut soon after the baby-boomers retire. Returns will fall as a result, so the rates of return for persons retiring after 2010 (most of whom have been born since 1960) will probably be lower than the estimates of Exhibit 10. Of course, the returns of particular individuals and groups may differ substantially from the average, as we will describe next.

V. IS SOCIAL SECURITY FAIR?

Dramatic changes in life expectancy, labor force participation, and family status have occurred since the Social Security system was established in 1935. Some of the changes were not envisioned by the designers of the system and have created hidden redistributions in Social Security that seem quite unfair. The system favors some income, ethnic, and demographic groups at the expense of others in ways that are subtle and often unintended.

A. Transferring Income from Low- to High-Wage Workers

Social Security has gained many supporters because of the belief that it redistributes wealth from rich to poor. The system is financed with a flat tax rate up to the cut-off limit, but the formula used to calculate benefits disproportionately favors workers with low lifetime earnings. Retirement benefits are based on the best 35 years of earnings from a worker's career. Benefits are calculated by taking 90 percent of the first \$6,372 a year of earnings, 32 percent of earnings between \$6,372 and \$38,424, and just 15 percent of earnings above \$38,424 up to the earnings cutoff of \$76,200. Workers earning up to \$38,424 a year receive a relatively high return on their Social Security taxes,

whereas those earning more than \$38,424 a year gain little from the additional taxes they pay into the system.⁷⁷

The benefit formula itself favors low-wage workers, but other factors need to be considered. First, high-wage workers tend to live longer than low-wage workers. Data on life expectancy and mortality rates are not directly available for wage groups, but data are available for groups according to years of education. Education and wages are correlated: people with more education tend to earn higher wages. Accordingly, the figures on life expectancy and years of education indirectly shed considerable light on the relationship between longevity and wages.

As Exhibit 11 shows, the age-adjusted mortality rate of persons with less than a high school education are 8 to 10 percent higher than the average for all Americans. As years of schooling increase, mortality rates fall. The age-adjusted mortality rate of college graduates is 21 percent below the average for all Americans, while the rate for persons with advanced degrees is 32 percent below the average. Lower age-adjusted mortality rates mean longer life expectancy. Given the strong correlation between education and earnings, the age-adjusted mortality figures indicate that, on average, Americans with higher earnings live longer than their counterparts with less education and lower earnings.⁷⁸ As a result, high-wage workers will, on average, draw Social Security benefits longer than low-wage workers. Low-wage workers are more likely to pay thousands of dollars in Social Security taxes and then die before, or soon after, becoming eligible for retirement benefits.

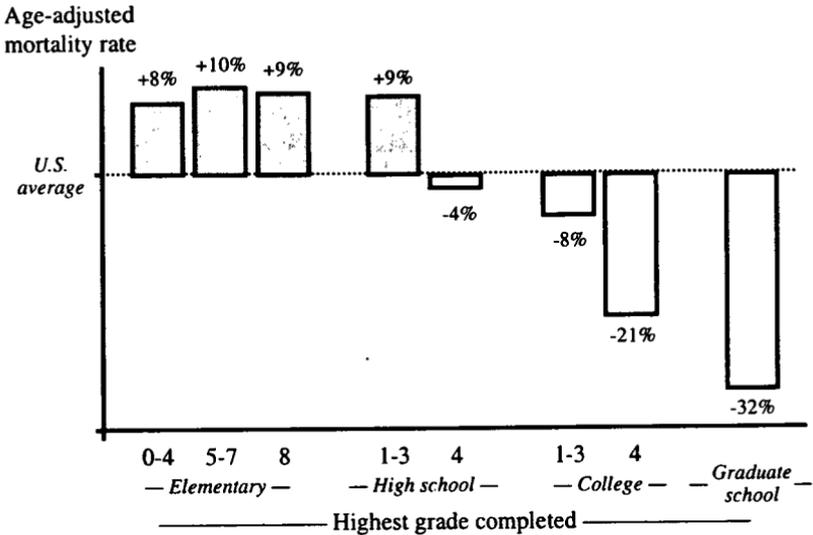
Second, low-wage workers generally begin full-time work at a younger age. Many work full time and pay Social Security taxes for years while future high-wage workers are still in college and graduate school. Low-wage workers generally pay more into the system earlier, and therefore forego more interest, than high-wage workers. This situation further reduces rates of return for low-wage workers.

⁷⁷The earnings brackets presented here are for 2000. The figures are adjusted each year for the growth of nominal wages. As earnings rise, retirement benefits as a share of prior base earnings fall. A worker with average annual earnings of \$6,372 receives an annual benefit of \$5,735 — 90 percent of the earnings on which he or she paid payroll taxes. In contrast, a worker with average annual earnings of \$60,000 receives an annual benefit of \$19,228, or only 32 percent of prior earnings.

⁷⁸Numerous factors such as nutrition, quality of health care, smoking, and abuse of alcohol and other drugs may contribute to the positive relationship between education (and income) and longevity of life. A full explanation of these underlying factors is beyond the scope of this study.

Exhibit 11: Mortality Rates by Level of Education

Persons with more years of schooling have lower age-adjusted mortality rates. Because education and income are closely linked, mortality rates are also higher among persons with lower incomes. Compared to their counterparts with more education and income, persons with less education and lower incomes are likely to draw Social Security benefits for fewer years.



Source: Data provided to JEC by Center for Data Analysis, Heritage Foundation.

Third, labor participation tends to fall as spousal earnings increase. Couples with a high-wage worker are more likely to gain from Social Security's spousal benefit provision, which provides the nonworking spouse with benefits equal to 50 percent of those the working spouse receives. A worker plus his or her nonworking spouse receive a benefit package 50 percent greater than a single person with the same earnings and payroll tax liability. The rate of return from Social Security is higher for single-earner couples than for any other category. The most recent report of the Social Security Advisory Council places the real rate of return for a one-earner, low-wage couple retiring in 2002 at 4.0 percent a year, versus 3.4 percent for a low-wage two-earner couple and 2.7 percent for a low-wage single male.⁷⁹

Fourth, not everyone with low lifetime earnings from wages is poor. Some low earners have substantial income from investments, entrepreneurial activities, inheritance, and other sources that are not subject to the payroll tax. Others are married to a spouse with substantial income. Even though they may not be poor, these people gain disproportionately from Social Security's benefit formula.

⁷⁹Social Security Advisory Council (1997), p. 219.

Exhibit 12: Life Expectancy by Gender and Ethnicity

For persons of the same birth year and gender, the life expectancy of whites and Hispanics persistently exceeds that of blacks.

		<i>Life expectancy at birth (years)</i>		
		<u>Blacks</u>	<u>Whites</u>	<u>Hispanics</u>
Birth year 1950 —	Male	58.9	66.3	**
	Female	62.7	72.0	**
Birth year 1970 —	Male	60.0	67.9	68.3*
	Female	68.3	75.5	74.0*
Birth year 1999 —	Male	68.4	74.7	77.2
	Female	75.1	80.1	83.7
Birth year 2025 —	Male	73.6	77.8	80.0
	Female	80.5	83.6	86.1

Sources: U.S. Census Bureau, *Methodology and Assumptions for the Population Projections of the United States: 1999-2000*; Texas Department of Health, *Texas Vital Statistics 1998 Annual Report*; National Center for Health Statistics, *National Vital Statistics Report*, v. 47.

Notes: *Texas data are used as a proxy for the 1970 cohort; no Hispanic data exist for the U.S. as a whole.

**Data are incomplete or inconsistent for these observations.

Two recent studies taking these factors into consideration suggest that Social Security may actually transfer wealth from low-wage to high-wage workers. A study using data from the Social Security Administration and the Health and Retirement Study found that when Social Security benefits are assessed for family units, rather than for individuals, the progressivity of the system disappears. Another study adjusted for differences in mortality rates, patterns of lifetime income, and other factors. It found that if a real interest rate (discount rate) of 2 percent is used to evaluate the pattern of taxes paid and benefits received, the redistributive effects of Social Security are essentially neutral. However, at a more realistic 4 percent real interest rate, Social Security actually favors higher-income households.⁸⁰

⁸⁰The studies are Gustman and Steinmeier (2000) and Coronado and others (2000). When comparing taxes and benefits across time periods, figures must be adjusted to take into account that \$1 in the future is not worth as much as \$1 today because today's dollar could be invested and earn interest. The interest rate that could have been earned on Treasury bills or a similar low-risk asset is generally considered the most appropriate rate for such calculations.

Exhibit 13: Rates of Return by Gender, Marital Status, and Ethnicity

As the result of their lower life expectancy, real rates of return from Social Security for blacks are, on average, less than for whites and substantially less than for Hispanics. This is true within gender, marital status, and birth-year categories.

		<i>Real annual projected rate of return on Social Security contributions (%)</i>		
		<u>Blacks</u>	<u>Whites</u>	<u>Hispanics</u>
Birth year 1940 —	Male (<i>single</i>)	1.2	1.5	2.8
	Female (<i>single</i>)	2.8	3.0	3.6
	Married two-earner family*	2.1	2.2	3.3
Birth year 1960 —	Male (<i>single</i>)	-0.5	0.7	2.1
	Female (<i>single</i>)	2.1	2.5	3.2
	Married two-earner family*	0.9	2.2	2.7
Birth year 1975 —	Male (<i>single</i>)	-1.3	0.2	1.6
	Female (<i>single</i>)	1.8	2.3	3.0
	Married two-earner family*	0.5	1.2	2.3

Source: Data provided to JEC by Center for Data Analysis, Heritage Foundation.

Note: *Statistics for married two-earner family assume two children.

B. Bias Against Those With Shorter Life Spans

In 2000, the average retiree reaching age 65 can expect to spend 18 years receiving Social Security benefits, after more than 40 years of paying into the system. But what about those not lucky enough to make it into their 80s, or even to reach the normal retirement age of 65? There are groups in society who have shorter life expectancies than average. In particular, people with less education, lower incomes, and certain ethnic backgrounds tend to have lower life expectancies and may receive unfair treatment. As Exhibit 12 illustrates, life expectancy for blacks is substantially lower than for whites and Hispanics.

When a worker and his or her spouse, if any, die before age 65, their heirs may receive nothing from Social Security. Social Security does have spousal and survivor benefits, but they are of little value to singles or families without children. Unlike private financial assets, Social Security benefits cannot be passed on to heirs, so years of payroll tax payments may come to naught with early death. Blacks are more likely than whites or Hispanics to pay a lifetime of payroll taxes, then die having received little in benefits.

The Social Security system has a benefit structure intended to redistribute income from higher-wage to lower-wage workers. The benefit formula by itself tends to favor blacks and Hispanics, who have lower incomes than the U.S. average. As Exhibit 13 shows, however,

lower than average life expectancy for blacks more than offsets the progressive nature of the benefit formula. The overall real rate of return for blacks on Social Security taxes is less than for whites. Therefore, on average, the Social Security system transfers income from blacks to whites. In contrast, Social Security is particularly advantageous to Hispanics, given their relatively long life expectancies and the progressivity of benefits. The rate of return for Hispanics is higher than for whites and substantially higher than for blacks.⁸¹ Social Security was not set up to transfer income from some ethnic groups to others, but under its current structure, it does.

Another group that receives unfavorable treatment from Social Security is people with life-shortening diseases. People with diabetes, heart disease, AIDS, and other diseases may spend decades paying into the system, only to die with loved ones unable to receive benefits from the Social Security taxes they have paid. (People with life-shortening diseases may receive disability insurance, but if they die before retirement they collect nothing from old age and survivors insurance, towards which they pay 10.6 percent of their wages.) By moving Social Security towards a system based on personal retirement savings accounts, every dollar paid into the accounts would be available to the heirs chosen by those who have worked hard but died before reaping the full benefit of their retirement savings.

C. Treatment of Working Women and Stay-at-Home Mothers

When Social Security was established, relatively few married women worked outside the home. As has been mentioned, a beneficiary of Social Security can receive benefits based on his or her own earnings or 50 percent of the benefits his or her spouse receives, whichever is greater. When a spouse dies, a lower-earning spouse can receive 100 percent of the benefits to which the higher-earning partner was entitled, rather than the 50 percent spousal benefit.

These rules work to the advantage of married couples where one partner spends substantial time outside the labor force. However, the

⁸¹For additional details on the redistributive effects of Social Security across ethnic groups, see Beach and Davis (2000). An additional factor making the rate of return high for Hispanics is that the group includes many immigrants. Immigrants often spend only part of their working years living in the United States and paying Social Security taxes, but as long as they have paid into Social Security for at least ten years (whether consecutive or not), they are eligible for old age benefits. The formula for Social Security benefits gives them a higher rate of return relative to workers who earn similar wages but spend all their working years in the United States. See Feldstein and Liebman (2000).

rules also impose a significant penalty for the spouse who re-enters the work force, works part time, or works full time but earns much less than the other partner. The payroll tax takes 12.4 percent of earnings but provides few or no additional benefits because the spousal benefit may nearly equal or exceed the benefits the lower-earning spouse could attain from his or her own earnings.

D. The Effects of Divorce

All retirees, regardless of marital status, can receive benefits based on their own earnings history. Divorced retirees are eligible for spousal benefits if their marriage lasted ten years or more and they have not remarried. However, if the marriage lasted even a day less than ten years, they lose spousal benefits completely. Moreover, divorced retirees who have remarried lose all claim to the benefits of an ex-spouse, no matter how long the marriage lasted. In effect, a divorced retiree whose ex-spouse had high wages is deterred from remarrying unless he or she can find a partner who earns or earned equally high wages. Another anomaly is that a worker who is married more than once for ten years or more can generate extra liabilities for the Social Security system, since each ex-spouse can collect spousal benefits based on the marriage.

In the early years of Social Security, these factors were of little consequence because divorce was relatively rare. It is now far more common: today, 48 percent of all marriages end in divorce. Almost two-thirds of divorces occur during the first ten years of marriage.⁸² As a result, the lives of many more people are now affected by Social Security's arbitrary allocation of benefits when a divorce occurs.

VI. SOCIAL SECURITY AND FAMILY INCENTIVES

Children are the future work force of a nation. When parents provide their children with nurturing, training, and education, they are promoting future productivity and growth. Having children and investing in their development also enhance the sustainability of pay-as-you-go Social Security. Unfortunately, the Social Security system itself weakens the incentive to raise children.

To be sustainable, Social Security requires every generation of working-age adults to perform two tasks: pay enough taxes to support current retirees and raise children who are able to fund their benefits in

⁸²Clarke (1995).

retirement. Yet Social Security benefits are based only on earnings, not on the time and effort we put into raising children. When parents put more effort into raising children, they are deprived of a large part of the rewards of their investment, which they must share with everyone else in the Social Security system.⁸³

To illustrate the nature of the problem, imagine a pay-as-you-go retirement system with only two families, the Smiths and the Powells. Mr. and Mrs. Smith and Mr. and Mrs. Powell all earn equal wages. The couples agree to pay equal retirement benefits to their parents, and their children will eventually pay for their retirement. The couples also decide that upon retirement they should get the same benefits because their earnings have been equal and they both contributed equally to supporting their parents in retirement.

But suppose the Smiths have three children and spend extensive time and effort raising them to be productive members of society, while the Powells have no children. When both couples retire, the Smiths' children will support both the Smiths and Powells. The earnings of the Smiths' children would not be available without the efforts of the Smiths. In effect, the Powells free-ride on the Smiths. If the Smiths realize this, they may be more likely to spend their money on consumption or invest it in things not subject to the Social Security

⁸³Some have suggested that Social Security's spousal benefit offsets the bias against families with children. However, the spousal benefit is also available to families without children. A homemaker who raises no children receives the same benefit as one who raises five children. A family in which the husband and wife have similar lifetime earnings gets no spousal benefit, regardless of how many children they raise. Furthermore, spousal benefits are not nearly as generous as commonly understood. By separating husbands and wives for purposes of determining how much each pays in payroll taxes (rather than acknowledging that they *share* their combined payroll tax burden equally) the formula artificially reduces the benefits of married couples. Most of the spousal benefit merely offsets this bias against married couples. For example, say a worker earns an average of \$48,000 per year during his career and his wife is a homemaker. Based on his lifetime earnings, the worker receives Social Security benefits of \$17,428 a year and his wife receives spousal benefits of \$8,714 (50 percent of \$17,428), for a total benefit package of \$26,142. If, instead of treating the husband's earnings separately, the system attributed half of the couple's combined earnings to the husband and half to the wife, each would be treated as earning \$24,000. Under the current benefit formula, each would receive \$11,376 a year, for a total of \$22,752. The spousal benefit is only 15 percent more than the couple would receive were its income split 50-50 between husband and wife. That amount is far less than the supposed 50 percent spousal benefit.

tax, rather than invest more in the education of their children, whose earnings will be subject to the tax.⁸⁴

The Social Security system is in a similar position, only on a much larger scale. Current workers are financing the retirement of the previous generation of workers, while their own future benefits largely depend on their generation's *overall* investment in child raising rather than on their own particular investment. Within each generation, Social Security transfers income from those who invest heavily in children to families without children. Thus, the system itself reduces incentives to have children and invest in their education and training. This is not the intent of Social Security, but it is nonetheless a consequence of its current structure.

VII. THE CURRENT SYSTEM'S GREAT DILEMMA

As we have mentioned, between now and 2030, the number of workers per Social Security beneficiary will fall from 3.4 to 2.1. Taxes will have to rise sharply or benefits will have to be cut substantially to maintain the current system. After 2030, things are projected to get even worse for Social Security.

Why not increase the payroll tax? If promised benefits are maintained, the Social Security payroll tax will have to rise to more than 18 percent. Since Medicare payroll taxes are also likely to rise as more Americans live longer, payroll taxes would take more than 20 percent of the earnings of future workers. As Exhibit 14 indicates, both the Social Security payroll tax rate and the income cut-off have been increased often. In real dollars, the top amount of Social Security taxes is already nearly twice the level of 1980 and more than three times the level of 1970. Consequently, 76 percent of working Americans now pay more in payroll taxes than in federal income taxes. The original plan was for the payroll tax to level off at 6 percent when the system reached maturity. The rate is now more than twice that level. The record is clear: higher taxes have failed to place the system on a sound financial footing. Furthermore, if the payroll tax rose to 20 percent or more, we could expect incomes to be lower than if the current tax rate were maintained. Lower incomes would reduce the level of payroll tax revenue, starting a vicious circle.

What about cutting benefits? To maintain the current 12.4 percent payroll tax, benefits will have to be cut approximately 17 percent by

⁸⁴For evidence that these effects do seem to occur, see Ehrlich and Zhong (1998) and Ehrlich and Lui (1998).

Exhibit 14: The Increasing Burden of Social Security Taxes

Over time, both the Social Security tax rate and tax base (adjusted for inflation) have persistently increased.

Year	Tax rate	Top tax base (real 2000 dollars)	Maximum Social Security taxes (real 2000 dollars)
1937	2.00%	\$ 35,896	\$ 718
1940	2.00%	\$ 36,921	\$ 738
1950	3.00%	\$ 21,447	\$ 643
1960	6.00%	\$ 27,936	\$ 1,676
1970	8.40%	\$ 34,632	\$ 2,909
1980	10.16%	\$ 54,157	\$ 5,502
1990	12.40%	\$ 67,613	\$ 8,384
2000	12.40%	\$ 76,200	\$ 9,449

Sources: Social Security Administration (2000); Haver Analytics.

Note: The tax rate and base are for Old Age, Survivors, and Disability Insurance (OASDI) and include both the employer and employee shares. The original plan for Social Security envisioned a top tax rate of 6 percent. The real 2000 dollar rates are based on June 2000 CPI estimates.

2020 and 33 percent by 2040. In real terms, benefits would still be at or above current levels. However, benefits would not rise as fast as wages, so people who relied mainly on Social Security benefits for income would fall lower and lower down the income ladder relative to the average worker. Increasing taxes and cutting benefits would both lower rates of return from Social Security.

VIII. RETIREMENT SAVINGS ACCOUNTS: A 21ST CENTURY APPROACH TO REFORMING SOCIAL SECURITY

Some ask, "How can we preserve Social Security in its existing form?" A better question is, "What is the best way to provide retirement security for working Americans?" Social Security was designed for the economic and demographic conditions of the 1930s. Today's world is vastly different, and, as a result, the structure of the current system may not be well suited for it.

As we consider how to adapt retirement security to the realities of the 21st century, several things are clear. It makes sense for a retirement security system to place more emphasis on saving and ownership of income-generating assets than has been the case in the past. The system should provide workers with a rate of return comparable to what they could obtain elsewhere. It should keep the elderly out of poverty without reducing economic prospects for future generations. It should

not work to the disadvantage of minorities or people with low earnings. It should not discourage work by imposing high taxes. Finally, it should free elderly Americans from dependency on politicians and manipulation by the political process.

Social Security's problems extend beyond the coming shortfall. The system is ill-suited for today's demographics. It redistributes income in arbitrary ways. It is a poor investment: the average real rate of return that young and middle-aged workers today can expect is 2 percent, which is less than one-third of the return equity markets have generated historically. Most policymakers have come to the conclusion that Social Security needs major reforms, the sooner the better, so as not to pass the problem on to future generations.

Retirement savings accounts (RSAs) provide a method for eliminating Social Security's coming shortfall and, at the same time, correcting other problems arising from the program's current structure. The unpleasant choice between tax hikes and benefit cuts can be avoided because the real rates of return for funds in RSAs would be substantially greater than the rate for Social Security. With RSAs, individuals would save and invest during their working years to provide advance funding for their own retirement benefits. Each worker would have a property right to the contributions and earnings in his or her RSA.⁸⁵ By allowing workers to save for their own retirement, RSAs could fill the system's coming funding gap so that future retirees could enjoy promised benefits without imposing higher payroll taxes on their children.

Although the RSA approach is relatively new, several countries now have experience with it. Chile was the leader. Beginning in the early 1980s, Chile allowed individuals to contribute funds to RSAs rather than the traditional pay-as-you-go system. They did so in overwhelming numbers. Chile's domestic savings rate increased dramatically and the country has experienced strong economic growth since the mid 1980s. While other factors, particularly trade liberalization and a more stable monetary policy, contributed to Chile's strong performance, the adoption of RSAs also played a role. Mexico, Peru, Argentina and several other Latin American countries adopted RSA-based plans during the 1990s.

Among high-income countries that have adopted RSAs, Australia is noteworthy because of its cultural and demographic similarities to the United States. Australia had a decades-old government retirement system that provided a modest flat-rate benefit for those over 65, which

⁸⁵Many Americans already make contributions to retirement investment funds. Contributions to pensions, 401(k) plans, and IRAs were about 2 percent of GDP in 1998. Social Security payments were about 4 percent of GDP.

was financed from general government funds. In the 1990s, Australia realized that its retirement system would face a large shortfall in the future because of substantial growth in the proportion of retirees. The Labor government of the time enacted reforms that moved the country away from a pay-as-you-go system towards an investment-based system. In 1997, Australia began phasing in its new system, which includes RSAs called "superannuation accounts." Workers must pay 8 percent of wages into these accounts at present, increasing to 9 percent starting in 2002; they can also make additional voluntary contributions. Some of the accounts are managed individually, while others are managed through companies, businesses, industry groups, or unions. The accounts may be invested in a variety of assets, including equity mutual funds, bond funds, property, and cash.

Benefits under the old system have been frozen and a means test has been imposed to tilt traditional benefits towards those with lower incomes. In the future, most workers will rely primarily on savings in their private accounts for retirement income, with those who had lower working incomes also receiving benefits from the traditional pay-as-you-go benefit structure.⁸⁶

Another high-income country with RSAs is the United Kingdom, which has a two-tier system, one tier being a pay-as-you-go system and the other an RSA system. Recently, Sweden adopted a plan that would allow its citizens to direct a portion of their payroll taxes into RSAs. Thus, as the U.S. considers the RSA approach, it is in a position to benefit from the experience of other countries.

Today's financial system provides a favorable environment for RSAs. U.S. financial markets are far more robust and sophisticated than they were in the 1930s. There is no reason why today's financial markets could not handle RSAs for every adult in the country. About half of all American families now own equities, and the vast majority are familiar with basic financial instruments such as bank savings accounts and personal credit. The dream of a secure individual retirement savings account for all Americans is an achievable goal.

IX. The Advantages of Retirement Savings Accounts

RSAs offer many advantages over the current pay-as-you-go Social Security system. Let us consider some of them.

⁸⁶Discussion of Australia is based on material in Ferrara and Tanner (1998), Mitchell (2000b), and Schieber and Shoven (1999, pp. 316-17).

A. More Savings and Investment

RSAs would stimulate economic growth by increasing savings and investment.⁸⁷ The funds paid into RSAs would flow into corporate bonds and stocks, providing additional funds that businesses need for investment in capital equipment and growth. As the economy's rate of investment increased, worker productivity and incomes would rise. In contrast, the current Social Security system does not save or invest the tax revenues that flow into government coffers from the payroll tax. These inflows are immediately paid out to beneficiaries or lent to the Treasury to finance other government activities.

B. More Incentives to Work and Earn

Social Security is financed by a payroll tax that drives a wedge between the employer's cost of paying wages and the employee's net earnings. Because the link between payroll taxes and retirement benefits is weak, the current system exerts a negative impact on employment and the incentive of individuals to earn. In contrast, funds contributed to RSAs would be retained by individuals as their own property, encouraging workers to earn more and build up greater nest eggs for retirement. The funds in RSAs would be channeled into investments earning market rates of return, thus providing positive feedback for saving. The incentive to work would be strengthened because the funds in a RSA would be passed on to heirs as part of a worker's personal property if he or she died before withdrawing all the money in the RSA. Social Security benefits cannot be passed on to heirs, so they may be completely lost should a worker die prematurely.

C. Less Dependency

A key advantage of RSAs is that they would reduce dependency on government and decrease the manipulation of the elderly for political gain. Economic dependency undermines political freedom. When citizens are dependent on the government, they are vulnerable to political manipulation. With RSAs, individuals would have an enforceable property right to their accumulated contributions. They would save to provide for their own retirement. As a result, they would be less dependent in their old age on the decisions of politicians and freer to exercise independent political judgment.

⁸⁷In the extreme case that the transition to RSAs were financed entirely by government borrowing, savings would not increase.

Economic dependency on government creates divisions between the interests of different groups in society, as the history of Social Security illustrates. Beginning with the revisions of 1939, politicians have used Social Security in efforts to “buy” the votes of the elderly. As a result, most working Americans now pay more in payroll taxes than in income taxes. Since RSAs would give all Americans a stake in the country's economic prosperity, people would be less likely to be enticed by short-sighted economic fixes, and be more concerned with policies that promote long-term prosperity.

President Franklin Roosevelt was well aware of the potential problems accompanying political dependency. When Social Security was established, he insisted that each person should have a clearly defined account, so that Americans would know “no damn politician can ever scrap my Social Security program.”⁸⁸

D. Fewer Hidden Transfers of Income

One of Social Security's hidden problems is the large and often perverse transfers of income that it generates. As we have shown, the current system imposes a high tax relative to benefits received on those with shorter life spans, various minority groups, and married working women. Under a system of RSAs, all funds could earn decent rates of return and the linkage between contributions and benefits would be stronger. RSAs would improve the fairness of the system.

X. RETIREMENT SAVINGS ACCOUNTS: FUNDING OPTIONS

The widespread appeal of RSAs for Social Security reform has led to numerous proposed structures for the new accounts. RSAs have been proposed as “add-ons,” “carve-outs,” or complete replacements for traditional Social Security retirement benefits. Add-on plans would allow, or mandate, that individuals contribute to a RSA an *additional* portion of their wages above the current 12.4 percent payroll tax. Carve-out plans would redirect a portion of the *current* payroll tax into workers' RSAs. Proposals for an investment-based system that would provide full advance funding would eventually replace traditional Social Security benefits with equal or higher benefits from RSAs, often with a phase-in period during which persons currently in mid-career would receive a combination of traditional and RSA benefits when they retire.

⁸⁸Moynihan (2000).

Most proposals for RSAs have important features in common. Generally, they would not affect the level of benefits for current retirees; would require that RSA account balances at retirement be taken as regular monthly payments or converted into annuities; would prescribe a range of relatively safe financial assets to be held in RSAs; and would provide for a minimum benefit guarantee from RSAs.⁸⁹ Almost all proposals would combine gradual reductions in traditional Social Security benefits with proceeds from RSAs to provide *total* retirement benefits at least as high as those promised under current law.

A. Add-On RSAs

Under add-on approaches, the current 12.4 percent Social Security payroll tax would continue to fund traditional retirement and disability benefits. Retirees and those close to retirement would remain fully in the current system, but persons younger than a given age, perhaps 55 years, would contribute funds to a RSA. The funds would be invested and used to cover the shortfall between promised traditional benefits and available payroll tax revenue. An add-on of about 2 percentage points would be required to bring the benefits of workers up to the promised level.⁹⁰ Individuals would decide how their RSA investments would be divided among equities, bonds, and money market funds or bank deposits.

Over time, traditional benefits would be scaled back and replaced with benefits funded by RSAs. Younger generations would derive more of their retirement benefits from RSAs and less from the pay-as-you-go system. As the system matured, half to two-thirds of benefits would come from the pay-as-you-go system and the rest from RSAs. The system would be sustainable and currently promised benefits could be delivered with the current tax plus the 2 percentage points of the add-on.⁹¹

The most recent report of the Social Security Advisory Council proposed that a 1.6 percent add-on be combined with cuts in the Social

⁸⁹For a summary and description of Congressional RSA proposals, see Joint Economic Committee (2000).

⁹⁰Recent calculations by the Congressional Research Service illustrate the potential of RSAs to fund future benefits. For an average income worker who will retire in 2030, a 2-percent RSA earning a rate of return equivalent to the past performance of the Standard and Poor's 500 index would receive monthly RSA benefits equal to about 28 percent of current law Social Security benefits.

⁹¹For more on how a mixed system of RSA add-ons and a gradual reduction in traditional benefits could be financed over time with the current 12.4 percent Social Security tax, see Feldstein and Samwick (2000).

Security benefit formula, a gradual rise in the normal retirement age, and other reforms.⁹² Under their plan, future retirees would receive about the same overall level of benefits as under current law, with about one-third of future benefits coming from the new RSAs. The Advisory Council estimated that reductions in traditional Social Security benefits and other changes under their plan would create long-term (75-year) actuarial balance in the financial structure of Social Security.

Add-on RSAs based on contributions of about 2 percent, combined with a gradual reduction in traditional benefits as the RSAs of younger workers have time to grow, would provide a fairly straightforward approach to fixing Social Security. Such an approach could be designed to maintain currently promised benefit levels, create long-term actuarial balance in the Social Security system, and eliminate the need to raise payroll taxes in the future. However, add-on approaches would push the combination of taxes and contributions higher. Doing so might discourage economic growth, and would still leave the Social Security system vulnerable to demographic changes if current projections of the system's finances turn out not to be correct.

B. Carve-Out RSAs

Carve-out proposals would fund RSAs by redirecting part of the 12.4 percent Social Security payroll tax into new personal accounts instead of imposing an additional required contribution or using general tax revenues for the contribution. Because the carve-out approach would keep the combined payroll tax plus RSA contribution lower than it would be under the add-on approach, the carve-out would have to be larger than the add-on to maintain currently promised benefits. Historical data indicate that it is reasonable to expect the long-term real rate of return from an appropriate portfolio of stocks and bonds to be at least twice the 2 percent return of traditional Social Security (see Section XI). Therefore, benefits from a 4 percent carve-out plus traditional benefits can be expected to generate total benefits at least equal to those promised by the current system. With a 4 percent carve-out, more of the total benefits would come from RSAs and fewer from the traditional system than would be the case with add-ons.

A key difference between add-on and carve-out RSA plans is their implications for the federal budget. Carve-out plans would reduce the flow of payroll taxes into the current Social Security system. Part of the rationale for such a redirection is that until 2015 Social Security payroll taxes are higher than needed to pay current beneficiaries. Under

⁹²Social Security Advisory Council (1997).

current law, the temporary Social Security surplus is lent to the Treasury, which uses it for other purposes. Many fear that Congress and the President will use these funds to initiate new programs and expand the size of government in the years immediately ahead. The carve-out approach would eliminate those funds as a source for financing more government spending.⁹³ The overall level of taxes plus contributions would be less under carve-out plans than under add-on plans. By increasing the proportion of wages that workers keep, carve-out plans would increase incentives for work, employment, and economic growth.

C. A Fully Investment-Based System Using RSAs

Add-on and carve-out proposals alike are designed to bring about long-term financial balance to Social Security by *partially* substituting higher-earning RSAs for pay-as-you-go Social Security. Another option would be to move towards a completely investment-based system. There are several proposals for moving to a fully investment-based system. All would maintain currently promised benefits to retirees and those nearing retirement. All would involve a phase-in period during which benefits from RSAs would gradually be substituted for traditional benefits. Some would replace only the old age and survivors insurance (OASI) portion of Social Security and retain the disability insurance (DI) program, which is funded with 1.8 percentage points of the 12.4 percent Social Security (OASDI) tax. Some would make the shift from the current pay-as-you-go system to RSAs voluntary at all age levels; others would require all younger workers to make the shift.

The major advantage of an investment-based system is that, when completely phased in, it could deliver any level of benefits at a lower cost than a pay-as-you-go system. This is because the historical long-term rate of return on private investment has been more than three times higher than the return that can be expected from the growth of the payroll tax base. An RSA contribution of approximately 5 percent would deliver the retirement and survivor benefits promised by the current system.⁹⁴ In contrast, according to the estimates of the Social

⁹³The potential impact on size of government is of considerable importance because the empirical evidence indicates that there is a negative relationship between government expenditures as a share of GDP and the rate of economic growth. Thus, a higher level of government expenditures will tend to reduce the economy's long-run growth rate. See Gwartney and others (1998).

⁹⁴For example, a couple with wages of \$40,000 a year over a 40-year career would accumulate a nest egg of \$399,270 if annual RSA contributions of 5

Security actuaries, it will take an old age and survivors payroll tax of approximately 15 percent to deliver these benefits in the future, versus the current 10.4 percent.

It has been claimed that moving towards an investment-based system is unfair because younger workers would have to “pay twice” for retirement, once to fund beneficiaries of the current pay-as-you-go system and again to provide advance funding for their own retirement. This burden is sometimes described as a transition cost that would be imposed by reform, but that is not an accurate description. Rather, the problem is that Social Security faces a shortfall in funding that any approach must somehow resolve. A properly designed investment-based system would reduce the costs of funding the shortfall compared to continuing with the current system.

There are a number of Congressional proposals to establish a fully investment-based retirement system. A bill by Rep. Mark Sanford (H.R. 249) would have workers divert 8 percentage points of the payroll tax into privately managed RSAs. As under a number of proposals, the new system would be mandatory for younger workers, voluntary for workers who are in mid-career, and would not affect current retirees. Other proposals that move the system towards full investment funding include those introduced by Rep. John Edward Porter (H.R. 874) and Senator Rod Grams (S. 1103), which are both based on a 10 percent payroll tax carve-out.

Investment-based proposals would use various methods of reducing traditional Social Security benefits as workers are transferred over to the new system in coming decades. (Again, benefits from RSAs would be increasing, so that *total* benefits would not fall.) The method adopted by the Grams and Porter plans is to issue “recognition bonds” to mid-career workers for payroll taxes already paid, should they opt for the new voluntary RSA system. When these workers retire, they would receive benefit payments from their RSA accounts, but not traditional Social Security benefits. Instead, they would receive benefits from their recognition bonds, which would repay them for the

percent of wages were invested at a 7 percent real annual rate of return. Even at a lower 5 percent rate of return, the value of their assets at the end of the period would be \$241,600. Assuming a life expectancy of 20 additional years, the assets from the 7 percent return (\$399,270) could be converted to an annuity that would provide the couple with \$35,804 a year for the rest of their lives. At a 5 percent rate of return, the assets could provide an annuity of \$18,417 a year. (We assume that a one-time fee equal to 5 percent of the principal is required to convert the assets into a lifetime annual income annuity. According to the U.S. General Accounting Office [1999, p. 25], the 5 percent figure is the current market rate for such conversions.)

value of past payroll taxes paid into the Social Security system, with an adjustment for inflation or interest earnings.

XI. RETIREMENT SAVINGS ACCOUNTS: DESIGN ISSUES

If Social Security legislation incorporating RSAs moves forward, a number of important structural issues will have to be addressed. Let us consider various options for making a RSA-based system efficient and fair.

A. Benefits for Married Couples

The Social Security system was designed for a time when most families had only one earner, married women seldom worked outside of the home, and divorce was uncommon. The system's spousal benefit and arbitrary treatment of divorce reflect this era. Today, two-earner families are the norm and women are almost as career-oriented as men. Furthermore, almost half of marriages today end in divorce. A retirement security system for the 21st century must reflect the current status of family earnings and provide for fairer, more uniform treatment when divorce occurs.⁹⁵

The problems of the current system would be overcome by recognizing the joint nature of earnings generated by married couples. When RSAs are established, this principle should be incorporated. It could be done by mandating that upon divorce, the RSAs of both spouses would be treated as a single pool and divided equally, regardless of the length of the marriage. With this arrangement, each spouse could have a secure property right to the funds channeled into his or her RSA during the marriage and that right would not be undermined by a subsequent divorce. If a spouse died prior to retirement, the funds in his or her RSA could be passed to the surviving spouse. If both spouses died prior to retirement, their RSA funds could be inherited by their children or other heirs. Providing for an equal split of RSA funds generated during a marriage could eliminate features of current Social Security rules that discourage some divorced people from remarrying. An equal split would also provide many divorced women with higher benefits than they receive under current rules.

⁹⁵For a more detailed explanation of how Social Security benefits affect the changing family structure in the United States, see Stanfield and Nicolaou (2000).

B. Would Equity Investments Make RSAs Risky?

With retirement RSAs, individuals would decide the allocation of their funds among bonds, stocks, and other securities. Many RSA proposals would require that individuals invest in diversified stock and bond funds, rather than individual company securities. With diversification, risk would be reduced and the returns to individual RSA accounts would approximate those of the broader market.

Some critics argue that investing RSA funds in equities would be risky because the stock market fluctuates substantially from year to year. But year-to-year fluctuations are of little relevance to long-term retirement investing. The risks and expected returns over periods of 20, 30 or 40 years are the relevant criteria. Over the long term, broad-based portfolios of equity investments have consistently outperformed other investment options.

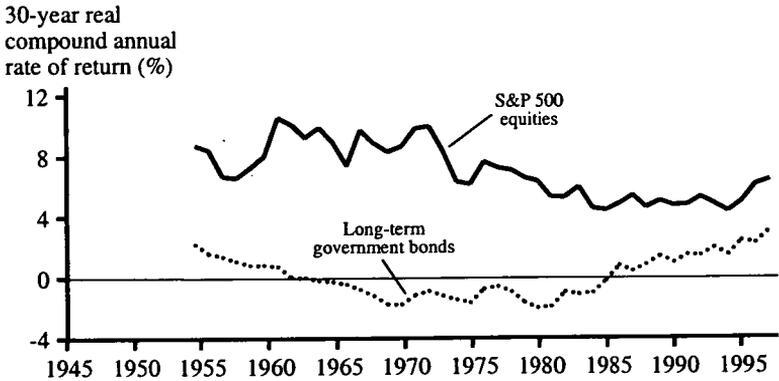
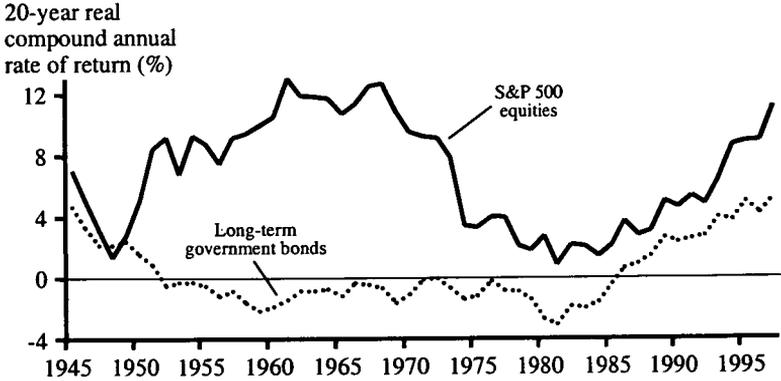
From 1925 to 1997, the Standard and Poor's 500, a broad-based index of large-company stocks, earned an average annual real rate of return of 7.7 percent, compared to just 2.1 percent for long-term government bonds. Thus, the real return to the S&P 500 was more than three times the return to government bonds. Equally important is that the longer the term of investment, the lower the risks associated with investing in stocks. Exhibit 15 illustrates this point. The top frame shows the 20-year moving average annual return for stocks and bonds from 1925 to 1997. Stocks outperformed bonds in 52 of the 53 overlapping 20-year periods.⁹⁶ Stocks provided positive real returns during all 53 overlapping 20-year periods, a feat achieved by bonds only 19 times. Furthermore, the 20-year average annual real return from stocks exceeded Social Security's 2 percent return in 49 of the 53 overlapping 20-year periods.

The bottom frame of Exhibit 15 shows average annual real returns for 30-year intervals, a time horizon comparable to that of retirement investing. These figures present an even more compelling case for stocks. Even during their worst 30-year period (1965-94), stocks provided a better rate of return than bonds did in *any* 30-year period. The consistency of the figures presented in Exhibit 15 are even more remarkable given the turbulence of the times. This 72-year period

⁹⁶The one exception was 1929-48, when the real return from large-company stocks was 1.4 percent and the real return from long-term government bonds was 2.2 percent. Historically, small-company stocks have earned an even higher rate of return than large-company stocks. From 1925 to 1997, the index of small-capitalization stocks earned an average real annual return of more than 9 percent.

Exhibit 15: The 20-Year and 30-Year Real Rates of Return of Equities and Long-Term Government Bonds

From 1925 to 1997, the real annual rate of return of the S&P 500 stocks averaged 7.7 percent. The comparable return for long-term government bonds was just 2.1 percent. Both the 20-year and the 30-year returns to equities consistently exceeded those of long-term government bonds. The 30-year average real annual rate of return to equities never fell below 4.3 percent.



Sources: Ibbotson Associates; JEC calculations.

Note: 20-year data start with 1945 and 30-year data start with 1955 because of data limitations.

included the Great Depression, the Second World War, the Korean War, the Vietnam War, various oil crises, and numerous recessions.⁹⁷

Professor Jeremy Siegel of the Wharton School has exhaustively researched returns from various asset classes dating back to the early

⁹⁷Social Security benefits are based on a worker's best 35 years of earnings. Texas A&M University researchers Thomas Saving and Andrew Rettenmaier have calculated that the returns for a fixed contribution (for example, \$50 a month) into an index fund invested 100 percent in stocks. They calculate the returns for each overlapping 35-year period since 1940. During the worst 35-year period, the average real rate of return was 4.2 percent a year. See Herrick and Cordell (forthcoming).

1800s. Siegel found that stocks have provided the best long-term investment option for nearly two centuries. He has remarked, “[Y]ou have to go back more than one and a half centuries, to the period from 1831 through 1861, to find any 30-year period where the return on either long- or short-term bonds exceeded that on equities. The dominance of stocks over fixed-income securities is overwhelming for investors with long horizons.”⁹⁸

Another aspect of RSAs that reduces investment risk is the extended period during which contributions would be made. Individuals would allocate funds into their RSAs over 30 to 50 years, essentially practicing “dollar cost averaging.” Over time, the purchase price of shares would approximate the average price during the period, so individuals would not be caught buying most of their shares at high prices. This would be true regardless of whether the market was relatively stable or highly volatile. The month-to-month or year-to-year volatility of the stock market is of little importance for RSA investing.

RSA investors would also be able to tailor their accounts to individual preferences for risk. Young workers would probably invest largely in growth stocks to take advantage of the high long-term returns such stocks earn. During mid-career, many investors would likely split their portfolios between stocks and bonds. As workers approached retirement and became more concerned about preserving asset value over the short term, they might well want to shift more of their investments toward bonds or cash.

Another way RSA investors could reduce the risk of low returns would be to use option contracts to guarantee a minimum rate of return, in exchange for giving up part or all of their chance to receive unusually high returns. The minimum could be set equal to the minimum currently provided by Social Security or to some other level chosen by individual investors.⁹⁹

C. Assuring Minimum Levels of Retirement Income

The current Social Security system provides beneficiaries with a flow of income throughout their retirement years, regardless of how long they live. Through annuitization, RSAs could do the same. An annuity is a contract, sold typically by life insurance companies, that converts a lump-sum payment into a stream of income, either for a specified number of years or for the remainder of one’s life. According to the General Accounting Office, the current cost of converting a lump sum to an annuity is a one-time charge equal to approximately 5

⁹⁸Siegel (1998), p. 15.

⁹⁹Feldstein and Ranguelova (2000).

percent of the assets annuitized.¹⁰⁰ (The amount paid per year depends on a number of factors, notably the age and sex of the buyer of the annuity and the rates of return prevailing on various types of investments the insurance company can make.) If conversions were more commonplace, as they would be under a RSA system, conversion costs could be expected to decline.

The purpose of annuities would be to provide individuals with secure guaranteed payments for life and avoid depleting their RSAs before death. To assure that they have sufficient funds in retirement, some proposals for RSAs would require individuals to convert enough RSA funds into annuities to assure a minimum level of real income—for example, an amount equal to at least the poverty income threshold. Because the expected additional years of life decline with age, the price of the annuity that would provide the minimum income for the remainder of one's life would be cheaper for persons retiring at an older age.

As long as individuals purchased annuities that would keep them out of poverty during their retirement years, or had sufficient funds in their RSAs to assure at least the minimum level of income under conservative assumptions, it would make sense to give them considerable discretion over how they used the funds in their accounts. Most Congressional plans would allow such freedom of choice. (Note that with many annuities, the annuity ends when the beneficiary dies. Funds available to be left to heirs will be those left after purchasing such annuities.)

Individuals could be allowed to annuitize any time after, perhaps, age 60. This flexibility would make it possible for individuals to make adjustments depending on their job opportunities, financial status, health, investments, and personal preferences. Some workers might want to retire at 60, while others might prefer to continue working to provide themselves with more income during retirement. People could also have the option of not purchasing annuities until after retirement, or even not purchasing annuities at all, if they maintained sufficient funds in their RSAs.

As workers approached retirement, most would switch substantial portions of the funds in their RSAs into bonds and money market investments to guard against volatility in the stock market. Flexibility in the timing of retirement would reduce the risk accompanying the movement of funds from equities to bonds, and eventually the conversion of funds into annuities. Flexibility is also important for

¹⁰⁰U.S. General Accounting Office (1999), p. 25. It should be noted that the existence of inflation-indexed bonds allows insurers to offer annuities indexed to keep pace with inflation.

another reason: the health and life expectancy of Americans in their sixties and seventies may change dramatically in the decades immediately ahead. Health conditions of persons approaching retirement already vary considerably. With future medical breakthroughs, the variability is likely to increase. Given these uncertainties, the flexibility provided by RSAs is particularly attractive.

D. The Poor and the Design of RSAs

Although the benefit formula for Social Security appears progressive, the current system tends to transfer income toward those with higher wages. This occurs mainly because high-wage workers tend to live longer and therefore receive Social Security benefits for more years than their low-wage counterparts.

How would a shift toward retirement RSAs influence the economic welfare of the poor? An RSA program that required each person to pay a constant percentage of his or her income into a RSA account would have no redistributive effects. Thus, it would eliminate the possible tendency of the current system to transfer income away from low-wage to high-wage workers.

The current system is particularly disadvantageous to people who die before retirement, who tend to be poorer than average. Low-wage workers are more likely to begin full-time work at a young age and have earnings well below the cutoff of the Social Security tax. Thus, payroll taxes account for a substantial portion of their income throughout their working lives. If they die before retirement, their Social Security taxes provide them with little in the way of benefits, nor do they provide anything for their heirs.¹⁰¹ The combination of a high payroll tax and low life expectancy makes it particularly difficult for low-wage workers to achieve better lives for their children.

Clearly, the RSA approach would be advantageous to those with low incomes who die prior to retirement. With RSAs, both their contributions and accumulated earnings would be passed along to their heirs. However, when low-income recipients live long, the progressive nature of the current benefit formula works to their advantage. Because of the progressivity of the formula, income levels during retirement are often not much different than during the working years. Steady

¹⁰¹See Gokhale and others (1999) for evidence that the structure of the current Social Security program adversely affects the wealth of low-income families. Social Security does provide a small death benefit, currently \$255, to a worker's survivors, and if the worker's children are under 18 they receive survivors insurance payments.

incomes are one reason why the poverty rate among the elderly is relatively low.

Critics have argued that retirement RSAs would lead to an increase in poverty among the elderly. It is true that with a uniform low rate for RSA contributions, those with very low wages during most of their working years would accumulate only modest amounts in their RSAs. Some might even be worse off than under the current system. However, there are various ways to assure that the poor could take advantage of RSAs. One method would be to incorporate a "progressive carve-out" into the RSA approach. Under this arrangement, a higher percentage would be channeled into RSAs up to a certain income cut-off. For example, the carve-out rate could be 6 percent of the first \$10,000 for a single earner (or \$20,000 for a married couple) and 2 percent for amounts above that level.¹⁰² This approach would channel a larger proportion of the earnings of low-income recipients into RSAs. In turn, the higher level of contributions would provide low-income earners with more money during retirement.

Another way of helping low-wage workers within the framework of RSAs would be to combine a flat percentage RSA carve-out with a greater reduction in the benefits from the current system for middle- and high-wage workers. Lower-income workers would not see their traditional Social Security benefit reduced much, thus giving them the same or higher income under the new system when income from their

¹⁰²With this carve-out, the annual contribution of a married couple with joint annual earnings of \$30,000 would be \$1,400. Invested at a 7 percent real annual rate of return (less than the average rate of return on equities during the last 75 years), annual contributions of \$1,400 over a 40-year career would have an asset value of \$279,489 at retirement. Assuming 20 additional years of life at retirement, the assets could be converted to an annuity that would provide an annual income of \$25,063 for the remainder of life. This annuity income is more than twice the poverty income threshold. Even at a 5 percent rate of return (a return well below that of equities), the \$1,400 annual investment would grow to assets valued at \$169,120 after 40 years. This amount would convert to an annuity providing an annual income of \$12,892 for the remainder of life. This annuity would provide the couple with an income level 15 percent above the poverty income threshold. (Again, we assume that a one-time fee equal to 5 percent of the principal—the current market rate—is required to convert the assets into a lifetime annual income annuity.) These figures represent income only from the annuity. If the couple had any other savings or earnings during retirement, these sources would enhance their income. It is also important to note that the couple would have a property right to all funds in their RSA. Therefore, should one or both die before retirement, the funds in their RSAs would go to the remaining spouse or other heirs.

RSAs is included. The new system would then have two parts: a traditional benefit with a fairly flat benefit structure for persons at all income levels, and RSAs based on investments from a flat-percentage carve-out from the payroll tax. Such a system would be simple in structure, and would ensure that the low-income elderly continued to receive adequate benefits. The United Kingdom has instituted a two-tier system along these lines.

Still other steps could be taken to assure that an RSA system did not disadvantage the poor. Tax deductions could be provided for contributions bringing the RSAs of those approaching retirement age up to the level required for the purchase of the minimum-income retirement annuity. The contributions might either be made directly or through charitable organizations focusing on assistance of this type. Such a reform would strengthen families and communities. It would encourage children, family members, civic organizations, churches, philanthropists, and charitable organizations to take steps to assure that virtually all of the elderly were able to retire with income levels above the poverty line.

The current system does not work well for the poor. It would be relatively easy to design RSAs in a manner that would be more beneficial to them. Rather than being an argument against reform, the treatment of the poor is an argument in favor of reforming the current system.

E. Administration of RSAs

Before a system of RSAs could be implemented, many administrative details would need to be ironed out. The details are important because they would affect the administrative costs of RSAs, the quality of customer service, and the status of RSAs as true private property rather than simply a new accounting device for the existing Social Security system.

A number of Congressional proposals, including those of Sen. Judd Gregg (S. 1383), Sen. William Roth (S. 263), and Rep. Jim Kolbe (H.R. 1793), would require that RSAs be *government-administered*. Government administration seems to offer simplicity and low administrative costs. The successful Thrift Saving Plan for federal employees is a model of how government administration might work. The Thrift Saving Plan has low administrative expenses and has successfully insulated itself from political pressure in its operations.

Under a government-administered RSA plan, payroll contributions would flow directly into the federal agency set up to administer accounts, and individuals would interact with this agency regarding their account balance, investment choices, and other issues. Note that

under such a plan, the government administration agency would likely make contracts with financial firms to actually invest the billions of dollars of RSA contributions into equity and debt securities. The contracts should be awarded on the basis of competitive bidding to hold costs down.

The National Academy of Social Insurance has estimated that such a government-administered system might cost \$25 to \$50 per participant in administrative fees each year.¹⁰³ Such costs are usually compared to total account assets to derive an annual "expense ratio." The Academy figures that this level of costs would translate into an average expense ratio of 0.1 to 0.2 percent of assets for accounts based on a contribution rate of 5 percent. An account earning a real return of 7 percent a year before expenses would therefore earn 6.8 to 6.9 percent after expenses. In a 1999 report, the General Accounting Office found that centrally administered RSAs with limited account options would probably have administrative costs of less than 0.5 percent of assets a year.¹⁰⁴

Other Congressional plans for overhauling Social Security instead propose a system of *privately administered* accounts. Employer-based plans, such as 401(k)s, or individually-based plans such as IRAs, could be used as models, although some analysts suggest that a unique and simplified system should be developed for RSAs. Most proposals would create a regulatory body to oversee the new private account industry to ensure that RSAs were properly administered and maintained.

There have been concerns raised that privately administered accounts could result in substantially higher administrative costs than government-administered accounts. However, a thorough study of the issue, by William Shipman of State Street Global Advisors, suggests that costs would be less than 0.4 percent a year in the case of a carve-out of 2 percent, and even smaller in the case of a larger carve-out.¹⁰⁵ The typical stock index fund has an annual expense ratio of only 0.25 percent.¹⁰⁶

There are advantages to private management, as compared to government management, that might merit potentially higher administrative costs. Private account management would foster

¹⁰³National Academy of Social Insurance (1998), p. 8.

¹⁰⁴U.S. General Accounting Office (1999), pp. 14-15. The Thrift Savings Plan for federal employees has an annual expense ratio of 0.09 percent, but a similar program for RSAs would probably have somewhat higher costs. Expense ratios are sometimes expressed in basis points. One basis point is one-hundredth of a percent (0.01 percent).

¹⁰⁵Shipman (1999).

¹⁰⁶National Academy of Social Insurance (1998), p. 68.

competition between providers to lower costs, improve customer service, and provide options that satisfy diverse customer needs. A monopoly government account administrator might have difficulty satisfying the service demands of the perhaps 200 million or so account holders under a national RSA system. Some members of the last Social Security Advisory Council backed a privately managed RSA structure because of fear that government management would succumb to the pitfalls of monopoly. They pointed out that even the federal Thrift Saving Plan is ultimately a voluntary program that competes for employees' money with other financial institutions.¹⁰⁷ In contrast, a new RSA program with mandated contributions into government accounts might become ineffective and bureaucratic because it would face no competition for the billions of dollars being paid in on a compulsory basis. Even worse, under the wrong circumstances, a government-administered RSA program might become the basis for government control of business because the government would own large amounts of stock in the nation's largest companies. Government control of business has generally been enormously inefficient and costly where it has been tried both in the United States and elsewhere.

There are other important advantages of private management for RSAs. Increased understanding of investment principles and interactions with financial firms would give many Americans who do not currently invest a greater sense of financial security and independence. In addition, the widespread advertising that could be expected under a private management system would encourage individuals to increase their retirement savings above the minimum mandated level. In fact, a number of Congressional proposals would allow additional contributions to RSAs to encourage workers to build up even more secure nest eggs for their retirement years. The widespread promotion of new Roth IRA accounts in recent years is the type of positive pro-savings message that financial companies would likely pursue under a competitive private RSA management structure.

XII. CONCLUSION

Modernizing Social Security for the 21st century is tremendously important for both economic and social reasons. The program was designed for the world of the 1930s characterized by a small elderly population, single-earner couples, and younger generations that were large relative to their older counterparts. These conditions are no longer present, and the system is ill-suited for the 21st century.

¹⁰⁷Social Security Advisory Council (1997), p. 130.

The current Social Security system redistributes income in complex, opaque ways. Its lottery-like transfers weaken the rights of workers to their own earnings, creating unfairness and reducing incentives to earn. Furthermore, the system unnecessarily intrudes into areas such as labor force participation, parenting, marriage, divorce, and other family choices that have little to do with retirement. Many of its incentive effects have results opposite from what the system's designers intended.

As the baby-boomers retire, the current Social Security surplus will be transformed into a large deficit. Without reform, taxes will have to be raised or benefits will have to be cut to cover the inevitable shortfall. RSAs can provide an escape from this unpleasant dilemma. Personal ownership of retirement accounts is a tried and true idea; in fact, it was Franklin Roosevelt's initial vision for Social Security. Because private investments (including those in equities) can provide a much higher rate of return than pay-as-you-go Social Security, they can cover the shortfall and deliver higher benefits without an increase in taxes.

RSAs would provide a property right to retirement savings and thereby prevent potential political manipulations of the Social Security system. They would also provide a means for ordinary Americans to benefit from equity investments. When held over the lengthy periods relevant for retirement funds, diversified equity portfolios have consistently yielded returns averaging more than three times the returns today's workers can expect from Social Security. Furthermore, these high returns have been consistent. Finally, RSAs would increase incentives to save and invest, reduce dependency, and eliminate the current inequitable treatment of certain ethnic groups and other people with relatively short life spans.

Social Security and Medicare currently consume a third of the federal budget. Without reform, they will consume more than half of the budget when the baby-boomers retire. Continuation of pay-as-you-go Social Security will lead to bigger government, higher taxes, and sluggish future growth. Either the payroll tax will have to be raised to more than 20 percent or income taxes will have to be raised by about 30 percent for the current system to deliver the promised benefits for Social Security alone. The result will be lower incomes than Americans would otherwise enjoy.

The United States has experienced remarkable prosperity since the early 1980s. The high future taxes and expansion in government implied by the current system will place that prosperity at risk. Thus, now is the time for the U.S. to begin shifting toward an investment-based retirement security system that is far more suitable for the 21st century.

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